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March 2018

DEFENSE INFRASTRUCTURE

Action Needed to Increase the Reliability of Construction Cost Estimates

Accessible Version

GAO-18-101

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GAO Highlights

Highlights of GAO-18-101, a report to congressional committees

Why GAO Did This Study

Between fiscal years 2005 and 2016, Congress annually appropriated between $2.5 to $9.6 billion in MILCON funding for the active component of the U.S. military to use for projects worldwide. Reliable project construction cost estimates are of great importance, since those estimates drive these appropriations.

House Report 114-537 accompanying a proposed bill authorizing national defense activities for fiscal year 2017 included a provision for GAO to report on DOD's MILCON cost estimating. This report examines the extent to which (1) the active component obligated and expended the MILCON appropriations received during fiscal years 2005-2016, (2) the active component reprogrammed MILCON appropriations during fiscal years 2010 through 2016, and (3) DOD's MILCON cost estimates are reliable for selected projects and DOD's guidance for developing estimates fully incorporates the steps needed for developing reliable estimates. GAO analyzed the active components' MILCON execution data and reviewed DOD's guidance for cost estimating and compared it with the best practices identified in GAO's *Cost Estimating and Assessment Guide*.

What GAO Recommends

GAO recommends that DOD ensure that its cost estimating guidance fully incorporate the steps needed for developing reliable cost estimates. DOD partially concurred with GAO's recommendation and stated that it will issue revised cost guidance in fiscal year 2019 that more fully incorporates those steps that would benefit the military construction program.

View GAO-18-101. For more information, contact Brian J. Lepore at (202) 512-4523 or leporeb@gao.gov.

What GAO Found

During fiscal years 2005 through 2016, Congress appropriated about $66 billion in military construction funds (MILCON) to the active duty Army, Navy, and Air Force (referred to as the active component) for projects. As of September 30, 2016, the active component had obligated all but about $5.1 billion and expended all but about $11 billion of those funds. Of the $5.1 billion remaining unobligated, about $4.6 billion was still available to be obligated because MILCON appropriations are generally available for new obligations for 5 years. According to Department of Defense (DOD) officials, available but unobligated amounts no longer needed may be either taken back by Congress or reprogrammed to other MILCON projects that the active component identifies as needing additional funding.

During fiscal years 2010 through 2016, the active component reprogrammed about $1.6 billion in MILCON appropriations to fund emergency projects, projects that were authorized but did not receive specific appropriations, and projects needing additional funding. Of this amount, the Army reprogrammed about $789 million; the Navy, about $535 million; and the Air Force, about $295 million.

DOD's guidance does not fully incorporate the steps needed for developing reliable estimates and the estimates for three projects that GAO reviewed were not reliable. Specifically, two of the three high-value projects GAO examined experienced a more than 30-percent increase from the initial cost estimates submitted to Congress. GAO determined that DOD cost estimators did not follow all the best practices associated with the four characteristics—comprehensive, well-documented, accurate, and credible—of a reliable estimate for these projects. GAO's Cost Estimating and Assessment Guide identifies 12 steps that, if used, are more likely to result in reliable and valid cost estimates. However, as shown below, DOD's construction guidance—the Unified Facilities Criteria—does not include all of these steps. Until DOD incorporates these steps, DOD and congressional decision-makers may not have reliable estimates to inform their decisions regarding appropriations and the oversight of projects.

GAO Assessment of DOD's Unified Facilities Criteria

Step	Assessment	Step	Assessment
1 Define estimate's purpose	Partially met	7 Develop the point estimate and compare with an independent estimate	Substantially met
2 Develop the estimating plan	Partially met	8 Conduct a sensitivity analysis	Minimally met
3 Define the program characteristics	Substantially met	9 Conduct a risk analysis	Partially met
4 Determine the estimating structure	Partially met	10 Document the estimate	Partially met
5 Identify ground rules and assumptions	Minimally met	11 Present estimate to management	Not met
6 Obtain the data	Partially met	12 Update the estimate	Partially met

Source: GAO analysis of Department of Defense (DOD) data and documentation. | GAO-18-101

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DOD	Department of Defense
MILCON	Military Construction

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Congressional Committees

In fiscal year 2016, Congress appropriated $3.9 billion in military construction (MILCON) funding for the active component[1] of the U.S. armed forces to use for projects[2] in the United States and overseas. The Department of Defense (DOD) receives a MILCON appropriation annually and uses it for the planning, design, and construction of facilities worldwide. To use these appropriations for specific projects, DOD submits proposals and cost estimates for approval by stakeholders including Congress and the Secretary of Defense. DOD guidance states that DOD must prepare the cost estimates as accurately as possible to reflect the budgetary cost of providing facilities.[3] However, DOD regularly experiences differences between initial cost estimates and final costs which, in some instances, necessitate changes to project schedules and budgets or requests for additional funding from Congress in order to award construction contracts and complete projects. Some differences between initial estimates and final costs for MILCON projects can be attributed to factors outside of DOD's control, such as unforeseen environmental and site conditions. However, some projects have raised congressional concerns regarding the quality of DOD's MILCON cost estimating practices.

Obtaining approval and funding for MILCON projects requires DOD to annually submit requirements and justifications in support of its funding requests to Congress. After congressional decision-makers approve projects and appropriate MILCON amounts, DOD may award contracts

[1]The Armed Forces of the United States comprise both an active and reserve component. The active component includes the active duty forces of the Army, the Navy, the Marine Corps, the Air Force, and the Coast Guard. The reserve component includes the Army National Guard of the United States, the Army Reserve, the Navy Reserve, the Marine Corps Reserve, the Air National Guard, the Air Force Reserve, and the Coast Guard Reserve. Our review is focused on the active duty Army, Navy, Marine Corps, and Air Force and we use "active component" to describe these organizations collectively.

[2]MILCON projects can include any construction, development, conversion, or extension of any kind to a military installation, whether to satisfy temporary or permanent requirements and can range in complexity from buildings such as barracks and maintenance buildings to infrastructure such as runways and utility systems.

[3]Unified Facilities Criteria 3-730-01, Programming Cost Estimates for Military Construction (June 6, 2011), (incorporating change 1, March 2017).

and obligate and disburse funds for projects.[4] DOD designates construction agents for the military departments and defense agencies with the primary responsibility for developing and refining these proposals and cost estimates and for managing the design and construction of projects.[5] If amounts designated for a specific construction project are unobligated and remain available at the project's completion, the amounts are considered savings and may be reprogrammed. Reprogrammed amounts may be used to fund other projects where there are shortfalls, projects authorized by Congress but not specifically funded through the appropriations process, and emergency projects, such as facilities destroyed by fires.

House Report 114-537 accompanying a proposed bill authorizing national defense activities for fiscal year 2017 included a provision for us to review and report on DOD's MILCON cost estimating and project management processes. We examined the extent to which (1) the active component obligated and expended the MILCON appropriations received during fiscal years 2005-2016, (2) the active component reprogrammed MILCON appropriations during fiscal years 2010 through 2016, and (3) DOD's MILCON cost estimates for select projects are reliable and DOD's guidance for developing estimates fully incorporates the steps needed for developing reliable estimates.

For our first objective, we reviewed MILCON appropriations and congressional designated amounts for projects included in appropriation acts and accompanying explanatory statements, committee reports, and conference reports accompanying the appropriations acts for fiscal year 2005 through fiscal year 2016 because these data were available electronically. Further, we analyzed the obligation and disbursement data of the active component's MILCON accounts using appropriation status by fiscal year program and subaccount reports, bid savings reports, and

[4]"Obligations" are incurred when an agency places an order, signs a contract, awards a grant, purchases a service, or takes other actions that require the government to make payments to the public or from one government account to another. "Disbursements" are amounts paid by cash or cash equivalent during a fiscal year to liquidate obligations.

[5]DOD "construction agents" are defined as the Corps of Engineers, the Naval Facilities Engineering Command, or such other approved DOD activity assigned the design or construction execution responsibilities associated with the military construction program. DOD Directive 4270.5, *Military Construction* (Feb. 12, 2005) assigns specific construction agents to be used by the services both within the United States and at facilities abroad.

annual reports from the U.S. Department of the Treasury.[6] We also collected and compared project data from each of the military departments on projects that had been initiated and completed during fiscal year 2010 through fiscal year 2016, including the initial project estimate submitted on Form 1391 (i.e., the form DOD uses to submit project-level requirements and justifications in support of its MILCON funding requests to Congress) and the contract award amount and analyzed any differences between the two.

For our second objective, we reviewed DOD's requests to Congress for prior approval to move MILCON funds from one project to another within a MILCON appropriation account, known as "reprogramming." We calculated the total number of times such requests were made and for what dollar amounts for fiscal year 2010 through fiscal year 2016. Furthermore, we selected one project from each military department from this same time frame and reviewed the accompanying Form 1391 and the reprogramming requests associated with the projects to illustrate how savings from one MILCON project may provide funds for another project. For both our first and second objectives, we assessed the reliability of the data by interviewing knowledgeable officials about the data and the steps that they had taken to verify the data's accuracy. We determined that the data were sufficiently reliable for our objectives.

For the third objective, we compared the process for developing the cost estimate for three selected projects with the characteristics and best practices for developing a reliable cost estimate as identified in our *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (the Cost Guide).[7] This guide is a compilation of cost estimating best practices drawn from across industry and federal government. We selected our projects from the universe of

[6]DOD appropriation status by fiscal year program and subaccount reports, known as 1002 reports, are submitted monthly to the Defense Finance and Accounting Service and contain appropriation, obligation and expenditure data throughout each account's unexpired and expired availability periods. Bid savings reports are quarterly 1002 reports on military construction bid savings achieved on previously appropriated MILCON projects. DOD submits the savings reports to Congress and includes its intended use of these savings. The U.S. Department of the Treasury issues an annual report called the *Combined Statement of Receipts, Outlays, and Balances of the United States Government*. This report is recognized as the official publication of receipts and outlays with which all other reports containing similar data must be in agreement.

[7]GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: Mar. 2, 2009).

projects that we reasonably expected could have begun execution (i.e., projects initiated during fiscal years 2012-2014); projects that were underway, but not substantially completed (i.e., between 10- and 75-percent complete); and projects that constituted a significant financial investment (i.e., projects with appropriations of $75 million or greater). Ultimately, of the 690 total projects we identified DOD-wide, 13 met these criteria. From the 13 projects, we judgmentally selected 3: (1) the construction of a replacement elementary school at Marine Corps Camp Foster, Japan; (2) the construction of a Strategic Command operations building at Offutt Air Force Base, Nebraska; and (3) the construction of a Marine Corps command headquarters and cyberspace operations building in Fort Meade, Maryland. These projects are not intended to constitute a projectable sample, but rather are intended to provide in-depth information about how cost estimates are developed, compared with best practices, across the active component.

In conducting the assessments for these three projects, we examined the processes used to develop both the Form 1391 estimate and the independent government estimate (i.e., the estimate used to award the contract) to determine whether the project cost estimates reflected the characteristics of a high-quality and reliable cost estimate, as defined in the Cost Guide. We also reviewed DOD's Unified Facilities Criteria and the military departments' respective guidance related to MILCON cost estimating and compared them with the steps needed for developing reliable cost estimates identified in Cost Guide. We interviewed officials and military project cost estimators at headquarters and at the Air Force's Engineering Division, and we also interviewed DOD's construction agents to discuss DOD's cost-estimating requirements and the guidance they follow in preparing, documenting, and reviewing project cost estimates. We provide further details on our scope and methodology in appendix I.

We conducted this performance audit from January 2016 to March 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

MILCON Appropriation and Obligation Process

DOD's MILCON appropriations are used to fund the acquisition, construction, installation, and equipping of temporary or permanent public works, military installations, facilities, and real property needed to support U.S. military forces in the United States and overseas. As with other DOD activities, no funds may be appropriated in any fiscal year or obligated or expended for MILCON activities unless such funds have been specifically authorized by law.[8] Each year, the National Defense Authorization Act authorizes amounts to be appropriated in each of the 18 programmatic MILCON appropriations accounts.[9] Individual or conference committee reports accompanying each fiscal year's National Defense Authorization Act provide specific congressional direction on authorized funding levels designated for specific construction projects supported by the various MILCON accounts. Similarly, conference committee reports or explanatory statements accompanying each fiscal year's appropriations acts establish appropriated funding levels for MILCON projects.

The process through which the active component requests funding for construction projects is supported by DOD's Form 1391 Military Construction Project Data (Form 1391). The Form 1391 is to be used to support each project proposed for inclusion in the MILCON appropriations request submitted concurrently with all other DOD appropriations requests annually. The forms are to be used for both new projects as well as urgent unforeseen projects. The Form 1391 describes the scope, total

[8]Section 114 of title 10 of the U.S. Code establishes that no funds may be appropriated, obligated, or expended for the use of any armed force unless funds have been specifically authorized by law.

[9]Eighteen programmatic MILCON appropriations are made annually in the Military Construction and Veterans Affairs and Related Agencies Appropriations Acts. Each service—the Army, the Navy and the Marine Corps, and the Air Force— receives a MILCON appropriation, as does the Air National Guard, the Army National Guard, and the Reserves. The Army, the Navy, the Marine Corps, and the Air Force also receive MILCON appropriations for expenses related to the operation and maintenance of family housing. Construction-related expenses of activities and agencies of the Department of Defense other than the military departments are provided for through the Military Construction, Defense-wide and Family Housing Operation and Maintenance, Defense-wide appropriations. Finally, the North Atlantic Treaty Organization's (NATO) Security Investment Program, the Defense Base Closure Account, and DOD's Family Housing Improvement Fund also receive MILCON appropriations.

project costs, and estimates of specific project elements. Costs associated with other project elements such as contingency and supervision, inspection, and design are also to be captured and included in the total requested amount. Finally, the Form 1391 is to include a description of the proposed construction and a requirements statement indicating what requirement the project provides. Project budget estimates are initially developed at the installation level and are provided to the next responsible level for review, validation, refinement, prioritization, and approval. Administrative support is to be provided when requested across the departments, but ultimately the installation is the originator and the primary responsible entity in developing the completed Form 1391.

MILCON appropriations are generally available for obligation for 5 fiscal years, at which time the appropriation expires. For 5 years after they expire, appropriations are available for limited purposes, such as liquidating obligations made during the period of availability or adjusting contract costs. After these 5 years, any remaining unexpended amounts, whether obligated or unobligated, are canceled and returned to the U.S. Treasury. Once funds are returned to the U.S. Treasury, they are no longer available for any purposes.

DOD obligates its appropriations throughout the period in which the appropriation is available. An “unobligated balance” is the difference between the total appropriation amount and total obligations made against the appropriated amounts. An “unexpended balance” is the total of obligated but unliquidated and unobligated amounts.[10] According to DOD officials, available but unobligated amounts no longer needed may be either rescinded by Congress or reprogrammed to other MILCON projects that the active component identifies as needing additional funding. Reprogrammed amounts may be used to fund other projects where there are shortfalls; for projects authorized by Congress but not specifically funded through the appropriations process; for emergency projects, such as for facilities destroyed by fires. DOD’s flexibility to reprogram without congressional approval is limited by the amount to be reprogrammed to a particular project. DOD’s Financial Management Regulation requires prior congressional approval for a reprogramming that would result in an increase exceeding 25 percent of a project’s

[10]Unliquidated obligations are those obligations for which payment has not been made through the issuance of checks or cash disbursements, or electronic funds transfers.

authorized base amount or $2 million, whichever is less.[11] Prior approval is not required when established costs or project-related thresholds are not reached.[12] According to DOD officials, reprogrammings requiring congressional approval are called "above-threshold reprogrammings" and those that do not are called "below-threshold reprogrammings."

DOD Construction Agents

DOD designates construction agents for the military departments and defense agencies with primary responsibility for developing and refining MILCON proposals and cost estimates, and to manage the design and construction of projects. Typically, the Army Corps of Engineers is the construction agent for Army MILCON-funded projects and the Naval Facilities Engineering Command is the construction agent for Navy and Marine Corps MILCON-funded projects. Either of those DOD entities can be the construction agent for the defense agencies and activities, such as for the Missile Defense Agency or Defense Education Activity, with the approval of the military department having jurisdiction of the real property facility. However, both the Army and the Navy may use each other's construction agent if it is in the interest of efficiency and cost-effectiveness or when otherwise considered appropriate. The Air Force may use either the Army Corps of Engineers or Naval Facilities Engineering Command for its projects. Additionally, the Air Force Civil Engineer Center, although not a designated construction agent, reviews and approves requirements for Air Force MILCON cost estimates, and in some cases may design and construct Air Force projects where both the Air Force and the commander of the assigned construction agent agree that it is the most efficient, expeditious, and cost-effective means to complete the project.

DOD Guidance for MILCON

Within DOD there are two levels of military construction guidance: the Unified Facilities Criteria and component-level guidance. The Unified Facilities Criteria are overarching, DOD-wide technical manuals and standards used for planning, design, construction, restoration, and

[11]DOD 7000.14-R, *Financial Management Regulation* (March 2011).

[12]Criteria triggering a requirement of prior approval also include project-related criteria, such as reprogramming for any emergency construction project or any restoration of damaged or destroyed facilities carried out under specific statutory authorities.

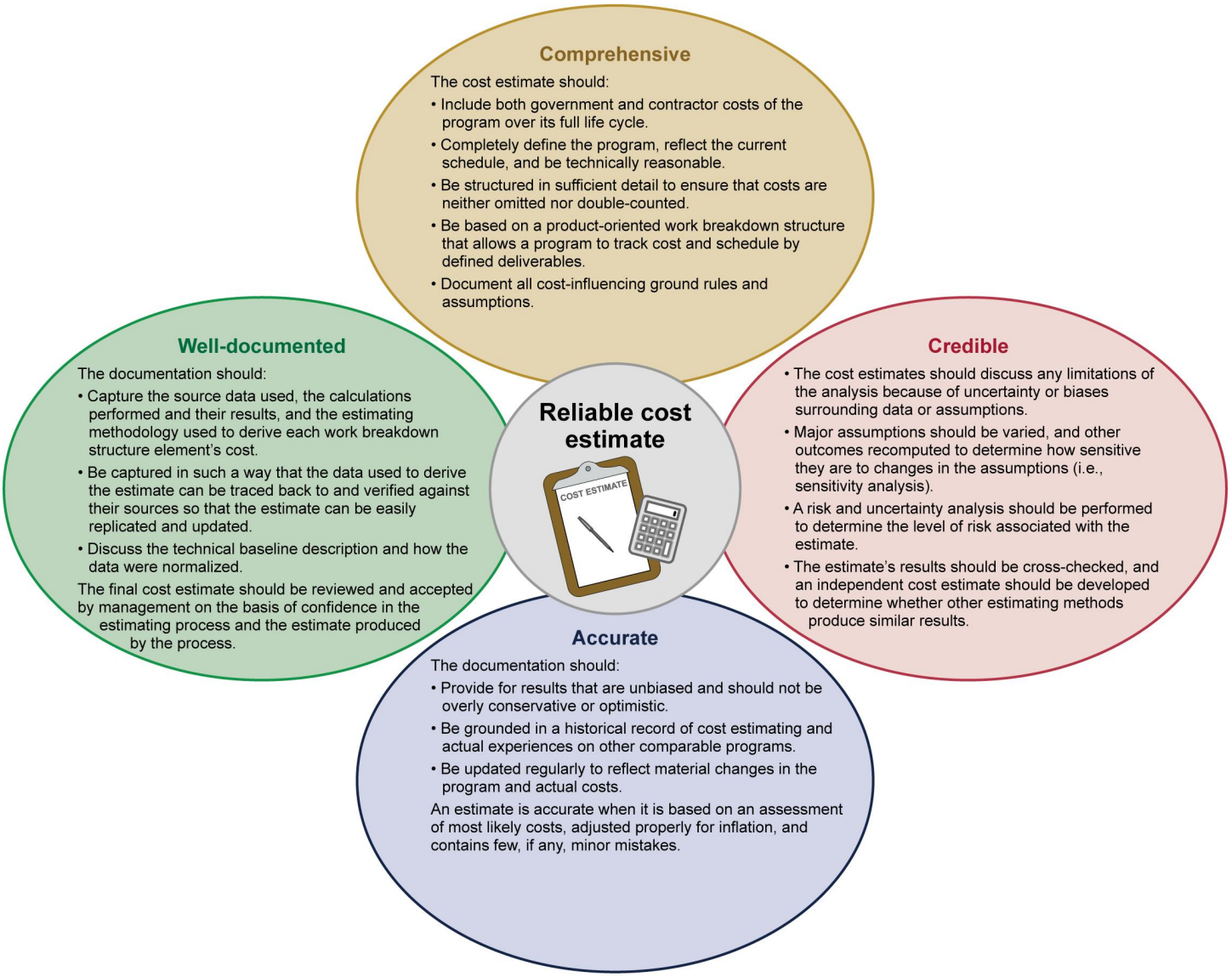
maintenance of DOD facility projects. The Unified Facilities Criteria was designed to standardize and streamline the process for developing, maintaining, and disseminating criteria in support of MILCON. The Unified Facilities Criteria contains guidance describing methods, procedures, and formats for the preparation of construction cost estimates and construction contract modification estimates, among other types of guidance. The Unified Facilities Criteria is to be used to the greatest extent possible by all the DOD regardless of funding source. In addition to the Unified Facilities Criteria, the military departments and agencies have also developed their own internal guidance on MILCON, providing further direction on conducting activities such as cost analysis and determining facility requirements.

Our Cost Assessment Model

We developed the *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (Cost Guide) to assist federal agencies in developing reliable cost estimates and also as a tool for evaluating existing cost estimating procedures. [13] To develop the Cost Guide, our cost experts assessed measures applied by cost estimating organizations throughout the federal government and industry and considered best practices for the development of reliable cost estimates. While the Cost Guide has a focus on developing cost estimates in the context of government acquisition programs, it outlines best practices that are generally applicable to cost estimation in a variety of circumstances. These best practices can be used to assess (1) the specific project cost estimates an agency develops to determine whether they meet the four characteristics—comprehensive, well-documented, accurate, and credible—for being reliable and (2) an agency's cost estimating guidance and procedures to see how well they incorporate all the steps needed for producing a high-quality cost estimate. Figure 1 shows the four characteristics and associated best practices for each that define a reliable cost estimate and table 1 shows the 12 steps identified in the Cost Guide that, if followed correctly, should result in high-quality cost estimates that management can use for making informed decisions.

[13] GAO-09-3SP.

Figure 1: Four Characteristics of a Reliable Cost Estimate and Associated Best Practices



Source: GAO. | GAO-18-101

Table 1: Twelve Steps for Producing High-Quality Cost Estimates

Step number	Step
1	Define estimate's purpose
2	Develop the estimating plan
3	Define the program characteristics

Step number	Step
4	Determine the estimating structure
5	Identify ground rules and assumptions
6	Obtain the data
7	Develop the point estimate and compare to an independent estimate
8	Conduct a sensitivity analysis
9	Conduct a risk analysis
10	Document the estimate
11	Present estimate to Management
12	Update the estimate to reflect actual cost and changes

Source: GAO. | GAO-18-101

The Active Component Obligated and Expended Most of Its Military Construction Appropriations Received during Fiscal Years 2005 through 2016

During fiscal years 2005 through 2016, Congress appropriated about $66 billion in MILCON funds to the active component[14] and, as of September 30, 2016, the active component had obligated all but about $5.1 billion and expended all but about $11 billion of those funds. Of the $5.1 billion that remains unobligated, about $4.6 billion was unexpired and available for new obligations (i.e., from fiscal year 2013 through 2016 appropriations).[15] Table 2 shows the active component's combined MILCON appropriations, obligations, and unexpended funds from fiscal year 2005 through fiscal year 2016.

Table 2: DOD Active Component's Military Construction Appropriations, Obligations, and Unexpended Funds, Fiscal Years 2005 through 2016

Dollars in millions

n/a	n/a	n/a	n/a	n/a	Unexpended funds

[14]We use the "active component" to describe the active duty forces of the Army, the Navy, the Marine Corps, and the Air Force.

[15]Amounts appropriated in fiscal year 2013 expired on September 30, 2017.

Fiscal years of availability[a]	Total appropriation as of 9/30/2016[b] (dollars)	Total canceled as of 9/30/16 (dollars)	Disbursed as of 9/30/2016[d] (dollars)	Net obligations as of 9/30/2016 (dollars)	Transferred out as of fiscal year 2016[f] (dollars)	Unobligated as of 9/30/2016 (dollars)	Unliquidated obligations as of 9/30/2016 (dollars)	Total unexpended as of 9/30/2016 (dollars)	Unexpended rate (percentage)
2016-2020	3,893.6	n/a[c]	142.6	1,123.4	0.0	2,770.2[g]	980.8	3,751.0	96.3
2015-2019	2,499.6	n/a[c]	569.7	1,662.0	62.1	775.4[g]	1,092.3	1,929.9	77.2
2014-2018	3,847.5	n/a[c]	2,147.2	3,158.6	65.5	623.4[g]	1,011.4	1,700.3	44.2
2013-2017	3,510.6	n/a[c]	2,400.4	2,987.5	70.9	452.2	587.1	1,110.2	31.6
2012-2016	6,311.4	n/a[c]	5,337.9	6,055.6	88.1	167.7	717.7	973.6	15.4
2011-2015	7,905.3	n/a[c]	7,334.7	7,792.8	36.7	75.8	458.0	570.6	7.2
2010-2014	7,852.9	n/a[c]	7,696.3	7,798.5	34.1	20.5	102.0	156.6	2.0
2009-2013	9,580.2	n/a[c]	9,288.1	9,316.9	45.2	218.14	28.8	292.2	3.0
2008-2012	7,806.1	n/a[c]	7,686.1	n/a[e]	81.8	n/a[e]	n/a[e]	120.0	1.3
2007-2011	4,292.2	1.2	4,208.6	n/a[e]	78.4	n/a[e]	n/a[e]	79.6	1.9
2006-2010	4,647.5	8.1	4,587.8	n/a[e]	48.4	n/a[e]	n/a[e]	56.5	1.3
2005-2009	3,9324.4	3.2	3,890.1	n/a[e]	34.6	n/a[e]	n/a[e]	37.8	1.1
Total	**66,079.3**	**12.5**	**55,289.3**	**47,587.8**	**645.9**	**5,135.0**	**4,985.0**	**10,778.4**	**16.3**

Source: GAO analysis of U.S. Treasury and Department of Defense data, as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]"Fiscal years of availability" refers to the period that military construction amounts appropriated in each fiscal year from 2005 through 2016 are available for new obligations for 5 fiscal years.

[b]Includes the appropriated amount, net funds transferred into and amounts rescinded from the account as authorized by statute.

[c]Not applicable because these amounts are not yet canceled. They either remain available for new obligations or are in the 5-year expired period and are available only for limited purposes.

[d]"Disbursements" are amounts paid by cash or cash equivalen, during the fiscal year to liquidate obligations.

[e]Not applicable because the amounts have been canceled and are no longer available for any purpose.

[f]"Transfer" is the shifting of all or part of the budget authority in one appropriation or fund account to another. DOD may transfer budget authority only as specifically authorized by statute.

[g]Amount remaining available for new obligation.

In general, during the early first few years of a MILCON appropriation available for 5 years, it is often likely that most of the funds will remain unobligated. For example, as shown in table 2 above, of the nearly $3.9 billion appropriated for military construction for the active component from the fiscal year 2016-2020 appropriation, only about $1.1 billion had been obligated as of September 30, 2016. This is not surprising given the time that it takes to award, obligate and disburse funds for projects. Ultimately, though, as an appropriation nears its expiration date, all or nearly all of the amounts have generally been obligated. In fact, as shown in table 2, for each MILCON appropriation received by the active component prior to fiscal year 2013 (fiscal years 2005 through 2012), less than 2 percent of

each year's appropriation was unexpended as of September 30, 2016. In appendix II, we provide additional analysis of the active component's unexpended and unobligated balances, by appropriation year and by military department.

Although ultimately, the active component obligates and expends most of its MILCON appropriations, the active component can experience a wide range of differences between initial cost estimates and final costs during the execution of individual MILCON projects, resulting in savings or shortfalls depending on the project. For example, we found that from fiscal year 2010 through fiscal year 2016, the active component achieved about $4.2 billion in MILCON project savings as a result, for example, of canceled projects, projects with lower than expected contractor bids, or the use of less expensive building materials. In appendix III, we provide additional analysis of the active component's estimated initial costs and the contract award amounts that were funded by MILCON appropriations for fiscal year 2010 through fiscal year 2016.

The Active Component Reprogrammed Hundreds of Millions of Dollars in Military Construction Appropriations in Fiscal Years 2010-2016

The active component reprogrammed about $1.6 billion in MILCON appropriations to fund shortfalls caused by emergency projects, projects that were authorized but did not receive specific appropriations, and projects needing additional funding in fiscal years 2010 through 2016. Of this amount, the Army reprogrammed about $789 million of about $14 billion in appropriated MILCON funds; the Navy, about $535 million of about $14 billion in appropriated MILCON funds; and the Air Force, about $295 million of about $7 billion in appropriated MILCON funds. Table 3 shows the number and amounts of above-threshold reprogrammings by the active component for fiscal years 2010 through 2016.

Table 3: Number and Funding Amount of the DOD Active Component's Military Construction Projects Requiring an Above-Threshold Reprogramming, Fiscal Years 2010 through 2016

Dollars in thousands

Fiscal year	Military department	Number of projects	Amount reprogrammed (dollars)
2016	Army	16	217,250
2016	Navy	7	83,449
2016	Air Force	0	0
2016	**Combined active component**	**23**	**300,699**
2015	Army	9	79,155
2015	Navy	11	108,551
2015	Air Force	5	50,505
2015	**Combined active component**	**25**	**238,211**
2014	Army	7	59,330
2014	Navy	4	135,261
2014	Air Force	10	124,029
2014	**Combined active component**	**21**	**318,620**
2013	Army	10	72,302
2013	Navy	4	98,548
2013	Air Force	6	50,869
2013	**Combined active component**	**20**	**221,719**
2012	Army	10	237,969
2012	Navy	3	61,170
2012	Air Force	8	26,832
2012	**Combined active component**	**21**	**325,971**
2011	Army	10	70,754
2011	Navy	5	47,838
2011	Air Force	1	3,000
2011	**Combined active component**	**16**	**121,592**
2010	Army	9	52,101
2010	Navy	0	0
2010	Air Force	3	39,610
2010	**Combined active component**	**12**	**91,711**
Total Army		**71**	**788,861**
Total Navy		**34**	**534,817**
Total Air Force		**33**	**294,845**

Fiscal year	Military department	Number of projects	Amount reprogrammed (dollars)
Total combined active component		**138**	**1,618,523**

Source: GAO analysis of Department of Defense information. | GAO-18-101

As seen in table 3, for any given year there are typically hundreds of millions of dollars reprogrammed. There are generally multiple active or canceled projects that result in cost savings, which may be used to fund authorized but not specifically funded projects. Below are three examples where the active component funded MILCON projects with amounts reprogrammed from other projects:

- **Repair Shop at Andersen Air Force Base, Guam:** This is an Air Force project to construct a pacific air resiliency low observable/corrosion control/composite repair shop in Guam. It is an authorized project that did not receive specific funding during the appropriation process but was fully funded by reprogrammed cost savings from active construction projects. Congress authorized $34.4 million for the repair shop in fiscal year 2015; however, no funds were specifically appropriated for the project. According to Air Force officials, since this was their top unfunded military construction priority, they used $34.4 million in savings achieved from other projects to construct the repair shop. Table 4 lists the three projects whose MILCON funds were reprogrammed for the repair shop at Andersen Air Force Base in Guam.

Table 4: Three Projects with MILCON Funding That Was Reprogrammed for the Repair Shop at Andersen Air Force Base, Guam

Dollars in thousands

Projects from which funds were reprogrammed	Location	Fiscal year	Appropriated amount	Current estimated cost of project (dollars)	Amount reprogrammed to fund repair shop (dollars)
Maintenance Hangar and Squadron Operations Center	Andersen Air Force Base, Guam	2014	132,600	109,950	23,300
Tactical Missile Maintenance Facility	Andersen Air Force Base, Guam	2014	10,530	8,030	2,500
Strike Fuel Systems Maintenance Hangar	Andersen Air Force Base, Guam	2015	64,000	37,736	8,600
Total	n/a	n/a	n/a	n/a	**34,400**

Source: Department of Defense fiscal year 2015 MILCON reprogramming request to Congress, dated May 21, 2015. | GAO-18-101

- **Training Facility at the Naval Air Station at Mayport, Florida:** This is a Navy project to construct a littoral combat ship training facility in Florida. It is a specifically funded project requiring additional funds

that received reprogrammed amounts from a canceled project. In fiscal year 2014, the initial cost as listed on the Form 1391 was estimated to be $20.5 million, but project costs increased by 41 percent to an estimated $28.9 million, according to a fiscal year 2016 reprogramming request to Congress. As detailed in the reprogramming request, the Navy attributed the increased cost to underestimated mission simulator and communication line requirements. To fund the increased costs, the Navy used $8.3 million in savings from a canceled project to complete the facility. Table 5 lists the canceled project that resulted in funds being reprogrammed for the training facility at Mayport.

Table 5: Canceled Project with Military Construction (MILCON) Funding That Was Reprogrammed for the Training Facility at the Naval Air Station at Mayport, Florida

Dollars in thousands

Project from which funds were reprogrammed	Location	Fiscal year	Appropriated amount (dollars)	Current estimated cost of project (dollars)	Amount reprogrammed to fund training facility (dollars)
Transmission Line	Naval Station Pearl Harbor, Hawaii	2014	30,100	0[a]	8,330

Source: Department of Defense fiscal year 2016 MILCON reprogramming request to Congress, dated August 15, 2016. | GAO-18-101

[a]This project was canceled and funds from the project were also used to fund projects at Naval Air Station Fallon, Nevada, and Naval Air Station Whidbey, Washington.

- **Barracks at Presidio of Monterey, California:** This is an Army project to construct a trainee barracks in California. It is a specifically funded project in need of additional funds that received reprogrammed amounts from active and canceled construction projects. In fiscal year 2011, the initial cost for the project as listed on the Form 1391 was estimated to be $63 million, but project costs increased by 51 percent to $95 million, according to a fiscal year 2015 reprogramming request to Congress. As detailed in the reprogramming request, the Army attributed the increased costs to a 3-year delay in construction and the need to move the project to a small, steep-terrain site. The reprogramming request further noted that the delay in construction was due to the discovery at the proposed construction site of a seismic fault and a plant that is an endangered species. To fund the increased costs, the Army sought to reprogram funds from the savings achieved from the active and canceled projects. Table 6 lists the projects that generated the reprogrammed funds used for the barracks at Presidio.

Table 6: Projects with Military Construction (MILCON) Funding That Was Reprogrammed for the Barracks at Presidio of Monterey, California

Dollars in thousands

Projects from which funds were reprogrammed	Location	Fiscal year	Appropriated amount (dollars)	Current estimated cost of project (dollars)	Amount reprogrammed to fund Monterey project (dollars)
Collective Training Range	Fort A.P. Hill, Virginia	2011	64,870	64,135	735
Battalion Complex	Fort Drum, New York	2011	45,378	44,055	1,323
Barracks	Schofield Barracks, Hawaii	2011	73,804	71,423	1,550
Barracks	White Sands Missile Range, New Mexico	2011	28,942	0[a]	28,942
Total	n/a	n/a	n/a	n/a	**32,550**

Source: DOD's fiscal year 2015 MILCON reprogramming request to Congress, dated April 3, 2015. | GAO-18-101

[a]This project was canceled.

DOD's Cost Estimates for Selected Construction Projects Were Not Reliable and DOD's Guidance Does Not Fully Incorporate the Steps Needed for Developing Reliable Estimates

Our analyses of the cost estimates for three selected projects shows that the cost estimates were not reliable, and DOD's cost estimating guidance does not fully incorporate all the steps needed for producing reliable estimates. We examined the cost estimates of three high-value military construction projects and noted that the initial cost estimates increased for all three projects, with cost estimates for two of the projects increasing by over 30 percent and the other, by about 7 percent. Specifically:

- **Strategic Command Operations Building, Offutt Air Force Base, Nebraska.**[16] The project to construct a nuclear, space, and network command and control operations building for the command at Offutt Air Force Base, Nebraska, increased from an initial cost estimate in fiscal year 2012 of $564 million to $601 million in fiscal year 2014 (or a 7-percent increase). According to a fiscal year 2014 reprogramming request to Congress, the Air Force attributed the increased cost to the fact that the project team did not appreciate the full scope, complexity, and risk of such an information technology- intensive project. These cost issues are similar to challenges we have reported on for other information technology-intensive MILCON projects.[17] The Air Force is the project owner and the Army Corps of Engineers is the construction agent for this project.
- **Command Headquarters and Cyberspace Operations Building, Fort Meade, Maryland.** The project to construct a command headquarters and cyberspace operations building with sensitive compartmented information facility in Fort Meade, Maryland, increased from an initial cost estimate in fiscal year 2013 of $84 million to $110 million in fiscal year 2015 (or a 31-percent increase). As detailed in the fiscal year 2015 reprogramming request, the Navy attributed the increased cost to higher than expected construction costs due to increased demand on the labor workforce in the Washington, D.C./Baltimore area and underestimated electrical power requirements. The Navy is the project owner and the Army Corps of Engineers is the construction agent for this project.
- **Elementary School Camp Foster, Japan.** The project to replace an elementary school at Camp Foster, Japan increased from an initial cost estimate in fiscal year 2012 of $79 million to $107 million in fiscal year 2014 (or a 35-percent increase). As detailed on the fiscal year 2014 reprogramming request, the Department of Defense Education Activity attributed the increased cost to the volatile construction climate in Japan caused by natural disasters; Japanese government policies, economic stimulus, and reform; and the planned developments for the 2020 Tokyo Olympic Games. Although this project is not owned by any of the military departments, it is being

[16]The Strategic Command is one of nine U.S. commands within DOD. Headquartered at Offutt Air Force Base, Nebraska, the Strategic Command is responsible for space operations; global missile defense; and global command, control, communications, computers, intelligence, surveillance, and reconnaissance.

[17]GAO, *Military Bases: Opportunities Exist to Improve Future Base Realignment and Closure Rounds*, GAO-13-149 (Washington, D.C.: Mar. 7, 2013).

managed by the Army Corps of Engineers in its role as a DOD construction agent through which it plays an important role in the development of the construction cost estimate. The Department of Defense Education Activity is the project owner and the Army Corps of Engineers is the construction agent.

To determine the reliability of the cost estimates for these three selected projects, we assessed the cost estimates against the best practices for developing a reliable estimate in our Cost Guide. As previously discussed, the Cost Guide defines the four characteristics—comprehensive, well documented, accurate, and credible—of a reliable cost estimate and the associated best practices related to each characteristic. In conducting these assessments, we examined both the Form 1391 estimate (i.e., the estimate used to develop the budget) and the independent government estimate i.e., (the estimate used to award the contract) for each project. Our analysis of the cost estimates for the three selected projects shows that the cost estimators did not follow all the best practices listed for each of the four characteristics. As a result, none of the characteristics were fully or substantially met. To be reliable, a cost estimate must substantially or fully meet each of the four characteristics. As the Cost Guide states, if any of the characteristics are not met, minimally met, or partially met, then the cost estimate does not fully reflect the characteristics of a high-quality estimate and cannot be considered reliable. Table 7 provides the results of our assessment of the cost estimates for each of the three selected projects.

Table 7: Summary of Our Assessment of the Cost Estimates for Three Selected Projects

Project	Characteristic	Assessment and examples of best practices incorporated
Strategic Command Operations Building, Offutt Air Force Base, Nebraska	Comprehensive	Substantially met Although both the Form 1391 and independent government estimate contained high-level cost estimates for primary facilities, supporting facilities, contingency, supervision, and inspection and overhead, neither estimate included operations and maintenance costs. Officials stated that operations and maintenance costs are not included because they are the responsibility of the military department that will be using the facility. Additionally, while the cost estimate contained extensive detail describing many work breakdown structure elements, it did not specifically identify ground rules and assumption risks and trace them to specific work breakdown structure elements.

Project	Characteristic	Assessment and examples of best practices incorporated
Strategic Command Operations Building, Offutt Air Force Base, Nebraska	Well Documented	Partially met Although the independent government estimate contained the quantity, unit of measure, and buildup of costs by work breakdown structure elements, the cost estimate documentation did not capture the source data in writing, did not describe the methodology used to derive work breakdown structure elements' costs, and did not describe the estimate in a narrative. Additionally, the documentation did not include any evidence that the estimate was reviewed and accepted by management above the level of the cost engineering branch.
Strategic Command Operations Building, Offutt Air Force Base, Nebraska	Accurate	Partially met The independent government estimate contained a detailed list of costs by work breakdown structure and the engineering build up technique was used appropriately. However, we could not determine whether the estimate had been properly adjusted for inflation because the cost estimate documentation does not discuss inflation. Further, we could not determine whether the estimate was unbiased because a formal risk and uncertainty analysis was not performed. Instead, a standard 5-percent contingency factor was applied to the project.
Strategic Command Operations Building, Offutt Air Force Base, Nebraska	Credible	Minimally met No formal risk and uncertainty analysis was performed as part of the independent government estimate or the Form 1391 estimate. Instead, the Air Force used a 5-percent contingency factor. Additionally, there is no evidence in the Form 1391 or the government estimate that major cost elements were cross-checked to see whether the results were similar. Finally, while officials said that they used cost estimating software to make pricing changes and examine sensitivity impacts to the cost estimate, they told us that they did not document the process and deleted the what-if scenarios that they developed.
Command Headquarters and Cyberspace Operations Building, Fort Meade, Maryland	Comprehensive	Partially met While the independent government estimate contained extensive detail describing many work breakdown structure elements, life-cycle costs were not included as part of the project's estimate. Additionally, while the ground rules and assumptions provided to us were prepared prior to the development of the independent government estimate, they were completed after the submission and approval of the Form 1391 estimate, which is the estimate used to establish the project's budget. Finally, ground rules and assumptions were provided in the government estimate for the overall estimate, but were not tied to specific work breakdown structure elements.
Command Headquarters and Cyberspace Operations Building, Fort Meade, Maryland	Well Documented	Partially met The Form 1391 was signed and approved by management; however, while Navy officials stated that they reviewed and validated the independent government estimate, there is no evidence of that review. Additionally, while there was a description of the costs and some ground rules and assumptions included in both the Form 1391 estimate and the independent government estimate, there were no data included as part of the estimates' documentation, descriptions of data normalization, or data reliability assessments.

Project	Characteristic	Assessment and examples of best practices incorporated
Command Headquarters and Cyberspace Operations Building, Fort Meade, Maryland	Accurate	Partially met No quantifiable cost risk or uncertainty analysis was conducted for either the Form 1391 or independent government estimate. Instead, the Navy used a 5-percent contingency factor to account for risk, thereby preventing an assessment of any potential bias (positive or negative) that was included in the estimates. Additionally, the Navy did not provide an Excel model to us for either the Form 1391 or government estimate. As a result, we could not confirm that there were no errors made while applying inflation. Finally, while the Form, 1391 and independent government estimate were updated prior to the contract's award, the Navy did not compare actual costs with estimated costs or perform variance analysis.
Command Headquarters and Cyberspace Operations Building, Fort Meade, Maryland	Credible	Minimally met No formal risk and uncertainty analysis was performed as part of the independent government estimate or the Form 1391 estimate. Instead, the Navy used a 5-percent contingency factor. Navy officials stated that they perform cross-checks as part of the estimating process. However, there was no evidence of cross-checks having been performed for either estimate.
Elementary School Camp Foster, Japan	Comprehensive	Substantially met Although the Form 1391 cost estimate, the independent government estimate and the military construction (MILCON) project are well-defined, neither estimate accounts for the operations and maintenance costs associated with the building that are impacted by the decisions made during design and construction. According to Department of Defense education officials, it is MILCON cost estimating policy to include only nominal values for operation and maintenance costs as these costs are the responsibility of the command that will be using the building.
Elementary School Camp Foster, Japan	Well Documented	Partially met The documentation created for the Form 1391 and independent government estimate contain a description of the requirements used to estimate the square footage of the MILCON project and of the buildings to be included for demolition. However, there is no formal documentation that ties together the estimates, the data, and the ground rules and assumptions for the estimates.
Elementary School Camp Foster, Japan	Accurate	Partially met The Department of Defense education activity used relevant historical data that were available at the time the Form 1391 and independent government estimates were developed and variances between planned and actual costs were documented, explained, and reviewed. However, although the independent government estimating model was provided, the Form 1391 estimating model was not. As a result, we could not confirm the accuracy of the Form 1391 estimate without thoroughly investigating how that cost model was constructed. Furthermore, an uncertainty analysis was not performed. Instead the Department of Defense Education Activity used contingency factors to account for risk, thereby preventing an assessment of any potential bias (positive or negative) that was included in the estimates.

Project	Characteristic	Assessment and examples of best practices incorporated
Elementary School Camp Foster, Japan	Credible	Minimally met No formal sensitivity and uncertainty analysis was performed for the Form 1391 or independent government cost estimate. Instead the Department of Defense Education Activity relied on standard contingency factors. While the Department of Defense Education Activity examined the estimate for cost drivers as part of the value engineering report process, there is no evidence in the Form 1391 or independent government estimate that major cost elements were cross-checked to see whether the results were similar.

Source: GAO analysis of Department of Defense data and documentation. | GAO-18-101

The Cost Guide also identifies 12 steps that, when incorporated into an agency's cost estimating procedures and guidance, are more likely to result in reliable and valid cost estimates. However, our analysis of DOD's department-wide cost estimating guidance—the Unified Facilities Criteria—found that the criteria did not include all of these 12 steps. The Unified Facilities Criteria incorporates some of the 12 steps to some degree, but not others, and as a result DOD is at a greater risk of developing estimates that are not reliable. Table 8 provides our assessment of the extent to which DOD's Unified Facilities Criteria incorporates the 12 steps needed to develop a high-quality, reliable cost estimate.

Table 8: Our Assessment of the Department of Defense's Unified Facilities Criteria

Step	Assessment of Unified Facilities Criteria
Define estimate's purpose	Partially met According to our Cost Guide, the purpose of a cost estimate is determined by its intended use and its intended use determines its scope and detail. To determine an estimate's scope, cost analysts must identify the customer's needs. Without understanding the estimate's purpose and scope, the estimate may not reflect the context to meet the customer's needs. The *Unified Facilities Criteria Programming Cost Estimates for Military Construction* (Programming Cost Estimates) and *Handbook: Construction Cost Estimating* (Handbook) lists and defines different types of estimates and their intended use. However, it is difficult to determine when each estimate should be used and what scope and detail should be included because the criteria use inconsistent terminology to describe the estimating phases, categories, and types.
Develop the estimating plan	Partially met According to our Cost Guide, an analytic approach to cost estimates typically entails a written estimating plan detailing a master schedule of specific tasks, responsible parties, and time frames. Without adequate time to develop a competent estimate, the team may be unable to deliver a product of sufficiently high quality. The Unified Facilities Criteria Handbook states that the responsibility of estimates falls to the cost engineering office and that, if it is necessary to contract cost estimating services, these services will be provided by competent firms experienced in cost engineering. However, it does not discuss developing an estimating plan that addresses time frames regarding the development and documentation of a construction cost estimate.

Step	Assessment of Unified Facilities Criteria
Define the program characteristics	Substantially met According to our Cost Guide, key to developing a credible estimate is having an adequate understanding of the acquisition program—the acquisition strategy, technical definition, characteristics, system design features, and technologies. This usually takes form in a technical baseline. A technical baseline should include a description of the program, define the requirements, and document the underlying technical and program assumptions necessary to develop a cost estimate and update changes as they occur. Consistent with our Cost Guide, the Unified Facilities Criteria Handbook addresses many parts of a technical baseline. For example, it states that the project narrative included in the estimate should describe the assumptions made during the preparation of the estimate and the project requirements that must be performed in sufficient detail to give a clear understanding of the scope of work. The Handbook also provides details regarding the approval process for revised estimates.
Determine the estimating structure	Partially met According to our Cost Guide, a work breakdown structure is the cornerstone of every program because it defines in detail the work necessary to accomplish a program's objectives. For example, a typical work breakdown structure reflects the requirements, what must be accomplished to develop a program, details common elements (the necessary support functions for constructing a facility), and provides a basis for identifying resources and tasks for developing a program cost estimate. The Unified Facilities Criteria Handbook states that a work breakdown structure is required and provides a top level example of a construction work breakdown structure. However, the work breakdown structure detailed in the Handbook does not list any work breakdown structure common elements, such as program management.
Identify ground rules and assumptions	Minimally met According to our Cost Guide, cost estimates are typically based on limited information and therefore need to be bound by the constraints that make estimating possible. These constraints are usually made in the form of assumptions. It is imperative that cost estimators document all assumptions well and test them for risk to portray the effects of any assumptions changing, so that management fully understands the conditions the estimate was based on. Such documentation and analysis provides management with an invaluable perspective on its decision. Additionally, cost estimators must ensure that assumptions are not arbitrary, that they are founded on expert judgments rendered by experienced program and technical personnel. While the Unified Facilities Criteria Handbook and the Department of Defense Facilities Pricing Guide identifies some assumptions, the Handbook does not discuss testing the assumptions for risks or point out that assumptions should be developed by cost estimators with input from the technical community.
Obtain the data	Partially met According to our Cost Guide, without sufficient knowledge about the source and reliability of the data, the cost estimator cannot know with any confidence whether the data collected can be used directly or need to be modified. The Unified Facilities Criteria places an emphasis on the DOD pricing guide as a source of data but does not discuss the process used to develop the data, any data limitations, or how the data were normalized. Without an explanation in policy, estimators may not have knowledge about the source and reliability of the data and may underestimate costs.

Step	Assessment of Unified Facilities Criteria
Develop the point estimate and compare with an independent estimate	Substantially met According to our Cost Guide, step 7 pulls all the information together to develop the point estimate—the best guess at the estimate given the underlying data. This includes the estimate's format, methodology, and validation process. Consistent with our Cost Guide, the Unified Facilities Criteria Handbook provides details regarding many of the activities of developing a point estimate, such as an estimate's format, cost methodologies, estimate validation, and a checklist for what an estimate should include to inform the review process. However, the Handbook does not state that an independent cost estimate should be developed to validate the point estimate.
Conduct a sensitivity analysis	Minimally met According to our Cost Guide, without sensitivity analysis that reveals how the cost estimate is affected by a change in a single assumption, the cost estimator will not fully understand which variable most affects the cost estimate. The Unified Facilities Criteria discusses a few aspects of a sensitivity analysis but skips many steps identified by the Cost Guide. For example, the Unified Facilities Criteria's Programming Cost Estimates for Military Construction identifies unique site sensitive conditions and develops factors to determine a cost impact resulting from those conditions, but does not discuss how to analyze cost impacts due to any changes in assumptions.
Conduct a risk analysis	Partially met According to our Cost Guide, quantitative risk and uncertainty analysis provide a way to assess the variability in the point estimate. Having a range of costs around a point estimate is more useful to decision makers because it conveys the level of confidence in achieving the most likely cost and also informs them on cost, schedule, and technical risks. The Unified Facilities Criteria's Programming Cost Estimates for Military Construction provides information regarding the application of contingency factors that provide a range of cost around the point estimate, but does not provide a description of risk analysis that would result in a quantified risk assessment that would identify a level of confidence associated with the estimate.
Document the estimate	Partially met According to our Cost Guide, documentation provides total recall of the estimate's detail so that the estimate can be replicated by someone unfamiliar with the program. It also serves as a reference to support future estimates. Documenting the cost estimate makes available a written justification showing how it was developed and aiding in updating it as key assumptions change and more information becomes available. According to the Cost Guide, some of the things that should be documented include, program inputs, estimating method by work breakdown structure cost element, sensitivity analysis, risk and uncertainty analysis, management approval, and updates to the estimate. The Unified Facilities Criteria Handbook highlights the importance of documentation and provides details regarding different categories of support documentation that should be included as part of the cost estimate. However, the guidance does not discuss documenting an estimate's sensitivity, conducting risk/uncertainty analyses, updating the estimate to reflect actual costs or any technical changes, or obtaining management approval.

Step	Assessment of Unified Facilities Criteria
Present estimate to management	Not met According to our Cost Guide, providing a briefing to management about how the estimate was constructed—including the specific details about the program's technical characteristics, assumptions, data, cost estimating methodologies, data, sensitivity, risk, and uncertainty—is necessary for management to have confidence that the estimate is accurate, complete, and high in quality. Furthermore, a cost estimate is not considered valid until management has approved it. The briefing should be clear and complete so that those who are unfamiliar with it can easily comprehend the competence that underlies the estimate results. The Unified Facilities Criteria does not discuss what information should be included as part of a briefing to management.
Update the estimate to reflect actual cost and changes	Partially met According to our Cost Guide, cost estimates must be updated whenever requirements change and the results should be reconciled and recorded against the old estimate baseline. The documented comparison between the current estimate (updated with actual costs) and the old estimate, allows the cost estimator to determine the level of variance between the two estimates. In other words, it allows estimators to see how well they are estimating and how the program is changing over time. The Unified Facilities Criteria Handbook discusses different updates to the estimate during the design process and the involvement of the cost engineering group during the contract modification process; however, the Handbook does not discuss updating the estimate to reflect actual costs or documenting reasons for any variances.

Source: GAO analysis of Department of Defense data and documentation. | GAO-18-101

Each of the military departments is required to follow the Unified Facilities Criteria to the greatest extent possible when designing and constructing facilities. However, as shown by the table above, there are shortcomings in these criteria when compared with our Cost Guide. Despite these shortcomings, the military departments have gone beyond the Unified Facilities Criteria and developed their own guidance that more closely aligns with our Cost Guide. For example, for both the "determining the estimating structure" and "obtain the data" steps, we found that all three military departments had developed their own guidance that more closely aligned with the 12 steps than the Unified Criteria did. In addition, some military departments are also making improvements to their cost estimating processes, but these improvements have not been fully implemented yet. For example, the Air Force Civil Engineer Center is implementing a cost estimate improvement plan to include the training of nearly 700 airmen and has conducted a study that directly ties the 12 steps in the Cost Guide to the associated tasks to be completed by the Air Force cost estimator to meet each individual step. However, the actions contained in the cost improvement plan have not been fully implemented and still remain in the concept phase. Similarly, although the Army Corps of Engineers is investigating expanding the use the of cost and schedule risk analysis—which could align with the best practices in the Cost Guide—that the Army currently conducts for selected civil work

construction projects to its high-cost military construction projects, the Army has not formally required the use of these tools. In appendix IV, we describe the guidance the military departments have developed beyond the Unified Facilities Criteria.

The Cost Guide is designed to establish a consistent methodology that is based on best practices and that can be used across the federal government for developing, managing, and evaluating capital program cost estimates. Air Force and Army Corps of Engineers officials noted that there may be instances in which following all the 12 steps of the Cost Guide for every MILCON project would not be appropriate to the risk level of the project. For example, it may not be realistic or to the military departments' benefit for the military departments to conduct a sensitivity and uncertainty analysis or develop an independent cost estimate for all the construction projects they initiate every year, especially for low-cost projects. We agree that it may not be suitable to fully apply all 12 of the cost estimating steps in the Cost Guide to all MILCON projects. However, incorporating the 12 steps into the Unified Facilities Criteria would establish consistency across DOD in the cost estimating process by ensuring that, for each MILCON project, each step in the Cost Guide would at least be considered. Furthermore, DOD could choose to establish thresholds—based on, for example, the dollar values of the projects—to guide the services in implementing the 12 steps for the most valuable projects. Skipping or not considering any step of the 12-step cost estimating process, especially for high-value projects such as those in our case studies, increases the risk that cost estimates may use improper assumptions, lack appropriate definition, or be otherwise unreliable. Without improving the Unified Facilities Criteria with respect to cost estimating processes, DOD and the services will not be positioned well to provide reliable cost estimates to DOD and congressional decision-makers.

Conclusions

Each year DOD receives billions of dollars in MILCON appropriations to use for projects in the United States and overseas. The quality of project cost estimates are of great importance since those estimates are the basis for DOD's requests for appropriations. While DOD's policy is that MILCON cost estimates be prepared as accurately as possible in order to reflect the full cost of constructing DOD facilities, DOD's Unified Facilities Criteria—the department's primary construction criteria for developing cost estimates—does not fully incorporate all of the steps needed for

producing reliable cost estimates. Until DOD incorporates the 12 steps of high-quality, reliable cost estimating into this department-wide construction criteria, DOD and congressional decision-makers may not have reliable estimates to inform their decisions regarding appropriations and the oversight of projects.

Recommendation for Executive Action

We are making one recommendation to DOD:

The Secretary of Defense should ensure that the Assistant Secretary of Defense for Energy, Installations, and the Environment work with DOD's construction agents, military departments, and other offices to improve DOD's MILCON cost estimating guidance (i.e., DOD's Unified Facilities Criteria) by fully incorporating all the steps needed for developing high-quality reliable cost estimates. (Recommendation 1)

Agency Comments and Our Evaluation

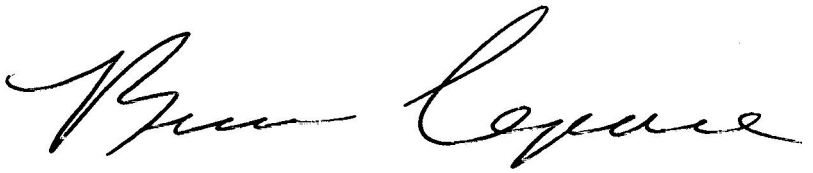
We provided a draft of this report to DOD. In written comments, which are reprinted in their entirety in appendix VI, DOD partially concurred with our recommendation. DOD also provided technical comments that have been incorporated into the report as appropriate.
DOD partially concurred with our recommendation to improve its cost estimating guidance by fully incorporating all 12 steps needed for developing high-quality, reliable estimates. DOD stated that it did not believe that it is suitable to fully apply all 12 steps to any construction project due to characteristics of the military construction program that DOD believes differ from those of major system or weapon acquisition programs. However, DOD also stated that it concurred with the intent and general applicability of the twelve steps to military construction and that DOD cost estimating guidance lacks specificity in several of these areas. DOD acknowledged that expanding its cost guidance to more fully incorporate these steps would benefit the military construction program, and that it is planning to address this by revising its cost guidance during Fiscal Year 2019.

In our report, we recognize that it may not be appropriate to fully apply all 12 steps to each construction project. For example, it may not be realistic or to the military departments' benefit to conduct a sensitivity and uncertainty analysis or develop an independent cost estimate for all the

construction projects they initiate every year, especially for low-cost projects. Accordingly, we did not recommend that DOD fully apply all 12 steps to each construction project, but rather that it fully incorporate the 12 steps into the Unified Facilities Criteria so that, at least, each step is considered for each project. DOD could then choose to establish thresholds—based on, for example, the dollar values of the projects—to determine for which the 12 steps should be fully applied or other circumstances in which some steps might not be applicable. We believe DOD's planned revisions will meet the general intent of our recommendation.

We are sending copies of this report to the appropriate congressional committees; the Secretary of Defense, the Secretaries of the Army, Navy, and Air Force. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff has any questions about this report, please contact me at (202) 512-4523 or leporeb@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VI.



Brian J. Lepore
Director
Defense Capabilities and Management

List of Committees

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Chairman
The Honorable Jack Reed
Ranking Member
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United States Senate
The Honorable Mac Thornberry
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Subcommittee on Military Construction, Veterans Affairs, and Related Agencies
Committee on Appropriations
United States Senate
The Honorable Charlie Dent
Chairman
The Honorable Debbie Wasserman Schultz
Ranking Member
Subcommittee on Military Construction, Veterans Affairs, and Related Agencies
Committee on Appropriations
House of Representatives

Appendix I: Scope and Methodology

To examine the active component's military construction (MILCON) obligations and expended balances, we reviewed MILCON appropriations found in appropriations acts, including accompanying explanatory statements and conference committee reports from fiscal year 2005 through 2016. Further, we analyzed the obligation and disbursement data of the active component's MILCON accounts, appropriation status reports, bid savings reports, as well as annual reports from the U.S. Department of the Treasury. We also collected and compared project data from each of the active component on projects that had been initiated and completed during fiscal year 2010 through fiscal year 2016. Specifically, we compared the initial estimate as shown on the Form 1391—the form DOD uses to submit requirements and justifications in support of its funding requests to Congress—with the contract award amount and analyzed any differences between the two.

To examine the amount of MILCON reprogramming during fiscal years 2010 and 2016 by the active component, we reviewed DOD's requests to Congress to reprogram MILCON funds from one project to another. We calculated the total number of times such requests were made and the dollar amounts for fiscal year 2010 through fiscal year 2016. We selected this time frame because the reprogramming requests were readily available from DOD. In addition, we judgmentally selected three projects from this same time frame and reviewed accompanying Forms 1391 and the reprogramming requests associated with the projects to illustrate instances in which savings from one MILCON project funded another project. We collected and analyzed data for fiscal years 2005 through 2016 on the active component MILCON appropriations, obligations, and disbursements and we collected reprogramming data for fiscal years 2010 through 2016. We assessed the reliability of the data by interviewing knowledgeable officials about the data and the steps that they had taken to verify the data's accuracy. We determined that the data were sufficiently reliable for our objectives.

To determine the extent to which DOD's MILCON cost estimates are reliable and DOD's guidance for producing estimates fully incorporates all of the steps needed for developing reliable estimates, we compared the

process for developing three selected projects with the characteristics and best practices for developing a reliable estimate identified in GAO's *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs* (the Cost Guide).[1] This guide is a compilation of cost estimating best practices drawn from across industry and federal government. We selected our projects from the universe of projects that we reasonably expected could have begun execution (i.e., projects initiated during fiscal years 2012-2014); projects that were underway, but not substantially completed (i.e., between 10- and 75-percent complete); and projects that constituted a significant financial investment (i.e., projects with appropriations of $75 million or greater). Ultimately, of 690 total projects we identified DOD-wide, 13 met these criteria and, from this sample, we selected the 3 projects included in this report: (1) the construction of a replacement elementary school at Camp Foster, Japan; (2) the construction of a Strategic Command operations building at Offutt Air Force Base, Nebraska; and (3) the construction of a Marine Corps command headquarters and cyberspace operations building in Fort Meade, Maryland.

In conducting the assessments for these three selected projects, we examined the processes used to develop both the Form 1391 estimate (i.e the form DOD uses to submit project-level requirements and justifications in support of its MILCON funding requests to Congress) and the independent government estimate (i.e., the estimate used to award the contract) to determine whether the project cost estimates had the characteristics of a high-quality and reliable cost estimate, as defined in the Cost Guide. These projects are not intended to be a projectable sample, but to illustrate how cost estimates are assessed against best practices. Although the Camp Foster project is not owned by any of the active component, the construction and planning of the project is being led by the Army Corps of Engineers in its capacity as a DOD construction agent and, as such, we decided to include it in our review. Additionally, we reviewed DOD's Unified Facilities Criteria and the active component's respective guidance related to MILCON cost estimating and compared them with the steps needed for developing reliable estimates identified in the Cost Guide. We also interviewed military project cost estimators and active component construction agents to discuss the requirements and guidance they follow in preparing, documenting, and reviewing project

[1]GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, GAO-09-3SP (Washington, D.C.: Mar. 2, 2009).

cost estimates. Table 9 details the documents we reviewed for our cost estimating assessments.

Table 9: Documents Reviewed for Cost Estimating Assessments

Subject	Document
Offutt Air Force Base Project	• Form 1391 • Independent Government Estimate • Kirk Associates Opinion of Construction Cost • After Action Review Cost Estimating for the Strategic Command Replacement Facility • Line Item Pricing Schedule and Option Items
Fort Meade Project	• Form 1391 • Independent Government Estimate • Unified Facilities Guide Specifications • Authorized Scope of Work Certification Memorandum • Revised Concept Drawings • Design Build Request for Proposal • Appendix LL: Amendments • Appendix D: Architectural Space Program and Room Data Sheets • Program Management Plan: National Security Agency Construction Program
Camp Foster Project	• Form 1391 • Independent Government Estimate • Cost Estimate Review Checklist • Education Facilities Specifications: Outdoor Spaces • Education Facilities Specifications: Food Service • Supplemental Statement of Work for Preparation of Final Design Documents • Work Breakdown Structure • Value Engineering Study

Subject	Document
Unified Facilities Criteria	• Unified Facilities Criteria 3-710-01A, *Code 3 Design with Parametric Estimating* (March 1, 2005) • Unified Facilities Criteria 3-730-01, *Programming Cost Estimates for Military Construction* (June 6, 2011) (Change 1, March 2017) • Unified Facilities Criteria 3-740-05, *Handbook: Construction Cost Estimating* (Nov. 8, 2010) (Change 1, June 2011) • Unified Facilities Criteria 4-010-05, *Sensitive Compartmented Information Facilities Planning, Design, and Construction* (Feb. 1, 2013) (Change 1, Oct. 2013) • Unified Facilities Criteria 4-610-01, *Administration Facilities* (May 6, 2008) (Change 2, May 2014) • DOD MIL-STD-3007F, *Standard Practice for Unified Facilities Criteria and Unified Facilities Guide Specifications* (Dec. 13, 2006) • Unified Facilities Criteria 1-300-08, *Criteria For Transfer and Acceptance of DOD Real Property* (April 16, 2009) (Change 2, Aug. 2011) • Unified Facilities Criteria 3-701-01, DOD *Facilities Pricing Guide* (March 2011) (Change 10, May 2016)
Army	• Army Regulation 415-15, *Army Military Construction and Nonappropriated-Funded Construction Program Development and Execution* (June 12, 2006) • Army Regulation 420-1, *Army Facilities Management* (Aug. 24, 2012) • Army Corps of Engineers Engineer Regulation 1110-3-1300, *Military Programs Cost Engineering* (Aug. 26, 1999) • Army Corps of Engineers Engineering Regulation 1110-1-1300, *Cost Engineering Policy and General Requirements* (March 26, 1993) • DOD MIL-STD-881C, S*tandard Practice Work Breakdown Structures for Defense Materiel Items* (Oct. 3, 2011) • Army Corps of Engineers Memorandum, *Procurement Instruction Letter (PIL) 2012-03 Requirements for Development, Review and Approval of Independent Government Estimates* (Jan. 10, 2012)

Subject	Document
Air Force	• Air Force Instruction 32-1021, *Planning and Programming Military Construction (MILCON) Projects* (Feb. 25, 2016) • Air Force Instruction 65-501, Economic Analysis Aug. 29, 2011) (Guidance memorandum update, March 14, 2017) • Air Force Manual 32-1084, *Facility Requirements* (Feb. 26, 2016) • Air Force Memorandum, *Air Force Sustainable Design and Development (SDD) Implementing Guidance* (June 2, 2011) • Air Force Presentation, *Finalization of the Air Force Cost Estimating Improvement Program* (August 10, 2016) • Air Force, *Guide to Cost Estimate Preparation, Review, and Validation* (June 12, 2015)
Navy	• Naval Facilities Engineering Command (NAVFAC), *Cost Engineering Policy and Procedures Interim Guidance* 2017-2019 (Jan. 20, 2017) • Secretary of the Navy Instruction 5223.2A, *Department of the Navy Cost Analysis* (Dec. 3, 2012) • NAVFAC, *Building Cost Index* (Change 10 May 25, 2016)

Source: Department of Defense documents. | GAO-18-101

We conducted this performance audit from January 2016 to March 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Active Component's Unobligated, Unexpended Balances, and Execution of Military Construction Appropriations, Fiscal Years 2005 through 2016

In this appendix we provide the supporting details on the active component's unobligated and unexpended balances of military construction (MILCON) appropriations for fiscal years 2005 through 2016.[1] We include details on unobligated and unexpended balances by appropriation year and include individual tables for each military department of the active component. Overall, the active component had high obligation and expenditure rates associated with MILCON appropriations that have expired or been canceled.[2] The Army, the Air Force, and the Navy consistently expended over 90 percent of amounts appropriated in fiscal years 2005 through 2011.

This appendix also provides supporting details on the active component's execution of MILCON appropriations for fiscal years 2010 through 2016. Using Department of Defense (DOD) data, we identified two groups of MILCON projects: congressionally directed and other. "Congressionally directed" projects are those MILCON projects specifically identified in an appropriation act, explanatory statement, and/or committee reports

[1]Fiscal year 2013 appropriations expired September 30, 2017; however, final data were not available at the time of this audit.

[2]"Unexpended balances" are the total of obligated but unliquidated and unobligated amounts. Time-limited appropriations such as military construction (MILCON) amounts expire at the end of the fiscal year for which they were appropriated. Unexpended balances are available for 5 years after expiration for limited purposes such as liquidating obligations incurred during the fiscal year of availability. After the 5-year period has elapsed, all obligated and unobligated balances are canceled, the expired account is closed, and all remaining funds are returned to the general fund of the U.S. Treasury.

accompanying the appropriation act for a specific fiscal year. "Other" projects refer to congressionally directed MILCON projects identified in an appropriation act, explanatory statement, and/or conference committee reports in a previous fiscal year. Overall, the active component obligated about 89 percent of its fiscal years 2010 through 2012 appropriations for congressionally directed projects whose appropriations expired on September 30, 2017.[3]

Unobligated and Unexpended Balances

Tables 10 through 12 present detailed information on unexpended and unobligated balances for each military department of the active component's MILCON appropriation for fiscal years 2005 through 2016, as reported by DOD as of September 30, 2016.

Army

Table 10 shows that for fiscal years 2005 through 2012, the Army expended almost all of its MILCON appropriations. Specifically, with the exception of fiscal year 2012, the Army expended at least 90 percent of its appropriations received each fiscal year for 2005 through 2011. Unexpended rates for amounts appropriated for fiscal years 2014 through 2016 vary and unobligated amounts for these years remain available for new obligations.

[3]Fiscal year 2013 appropriations expired September 30, 2017, but final execution data were not available at the time of this audit.

Table 10: Army Military Construction Appropriations, Obligations, and Unexpended Balances, Fiscal Years 2005 through 2016

Dollars in millions

n/a	n/a	n/a	n/a	n/a	Unexpended funds				
Fiscal years of availability[a]	Total appropriation as of 9/30/2016[b] (dollars)	Total canceled as of 9/30/16[c] (dollars)	Disbursed as of 9/30/2016[d] (dollars)	Net obligations as of 9/30/2016 (dollars)	Transferred out as of fiscal year 2016[f] (dollars)	Unobligated as of 9/30/2016[g] (dollars)	Unliquidated obligations as of 9/30/2016 (dollars)	Total unexpended as of 9/30/2016 (dollars)	Unexpended rate (percentage)
2016-2020	756.4	n/a[c]	46.0	143.4	0.0	613.0	97.4	710.4	93.9
2015-2019	651.1	n/a[c]	138.2	328.9	59.6	262.6	190.7	512.9	78.8
2014-2018	1,173.1	n/a[c]	716.5	999.3	61.6	112.2	282.8	456.7	38.9
2013-2017	1,749.4	n/a[c]	1,102.2	1,446.3	67.3	235.8	344.1	647.2	37.0
2012-2016	3,013.8	n/a[c]	2,515.1	2,824.1	67.3	122.5	309.0	498.7	16.5
2011-2015	3,590.8	n/a[c]	3,365.8	3,525.3	17.5	48.0	159.5	224.9	6.3
2010-2014	3,157.4	n/a[c]	3,125.8	3,149.3	4.1	4.1	23.4	31.6	1.0
2009-2013	5,059.5	n/a[c]	4,832.9	4,836.3	28.4	194.9	3.3	226.6	4.5
2008-2012	4,338.2	n/a[c]	4,263.2	n/a[e]	36.8	n/a[e]	n/a[e]	75.0	1.7
2007-2011	2,039.4	2.9	1,976.3	n/a[e]	60.2	n/a[e]	n/a[e]	63.1	3.1
2006-2010	1,679.0	0.0	1,675.3	n/a[e]	3.7	n/a[e]	n/a[e]	3.7	0.2
2005-2009	1,992.9	0.8	1,982.2	n/a[e]	10.0	n/a[e]	n/a[e]	10.7	0.5

Source: GAO analysis of U.S. Treasury and Department of Defense data. Data reported as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]Range of fiscal years is the period of availability for MILCON amounts appropriated in each fiscal year from 2005 through 2016. MILCON appropriations are available for new obligations for 5 fiscal years.

[b]Includes the appropriated amount, net funds transferred into and amounts rescinded from the account as authorized by statute.

[c]Obligations are not applicable here because any amounts remaining are in the 5-year expired phase during which they remain available for limited purposes.

[d]Disbursements are amounts paid by cash or a cash equivalent during the fiscal year to liquidate obligations.

[e]Not applicable because the amounts have been canceled and are no longer available for any purpose.

[f]"Transfer" is the shifting of all or part of the budget authority from one appropriation or fund account to another. DOD may transfer budget authority only as specifically authorized by statute.

[g]This amount remains available for obligation.

Air Force

Table 11 shows that, for fiscal years 2005 through 2013, the Air Force expended almost all of its MILCON appropriations. Specifically, the Air Force expended at least 95 percent of its appropriations received each year for fiscal years 2005 through 2011 and also in fiscal year 2013. Unexpended rates for amounts appropriated for fiscal years 2014 through 2016 vary and unobligated amounts for these years remain available for new obligations.

Table 11: Air Force Military Construction Appropriations, Obligations, and Unexpended Balances, Fiscal Years 2005 through 2016

Dollars in millions

n/a	n/a	n/a	n/a	n/a	Unexpended funds				
Fiscal years of availability[a]	Total appropriation as of 9/30/2016[b] (dollars)	Total canceled as of 9/30/16[c] (dollars)	Disbursed as of 9/30/2016[d] (dollars)	Net obligations as of 9/30/2016 (dollars)	Transfer-red out as of fiscal year 2016[f] (dollars)	Unobligated as of 9/30/2016[g] (dollars)	Unliquidated obligations as of 9/30/2016 (dollars)	Total unexpended as of 9/30/2016 (dollars)	Unexpended rate (percentage)
2016-2020	1,416.0	n/a[c]	40.5	433.7	0.0	982.3	393.2	1,375.5	97.1
2015-2019	825.9	n/a[c]	227.1	633.5	0.0	192.4	406.4	598.9	72.5
2014-2018	1,040.3	n/a[c]	726.2	952.4	0.0	87.9	226.1	314.1	30.2
2013-2017	295.0	n/a[c]	285.6	289.9	0.0	5.1	4.3	9.4	3.2
2012-2016	1,219.6	n/a[c]	1,057.6	1,176.5	16.7	26.5	118.9	162.0	13.3
2011-2015	1,071.7	n/a[c]	1,020.4	1,041.4	18.1	12.2	21.0	51.3	4.8
2010-2014	1,268.1	n/a[c]	1,216.6	1,230.2	28.4	9.5	13.5	51.4	4.1
2009-2013	1,107.7	n/a[c]	1,080.4	1,085.5	15.9	6.3	5.1	27.3	2.5
2008-2012	1,186.9	n/a[c]	1,159.7	n/a[e]	24.0	n/a[e]	n/a[e]	27.1	2.3
2007-2011	1,105.9	1.2	1,089.9	n/a[e]	14.8	n/a[e]	n/a[e]	16.1	1.5
2006-2010	1,469.4	8.1	1,423.3	n/a[e]	38.0	n/a[e]	n/a[e]	46.1	3.1
2005-2009	897.3	3.2	871.5	n/a[e]	22.6	n/a[e]	n/a[e]	25.8	2.9

Source: GAO analysis of U.S. Treasury and Department of Defense data. Data reported as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]Range of fiscal years is the period of availability for MILCON amounts appropriated in each fiscal year from 2005 through 2016. MILCON appropriations are available for new obligations for 5 fiscal years.

[b]Includes the appropriated amount and net funds transferred into and amounts rescinded from the account as authorized by statute.

[c]Obligations are not applicable here because any amounts remaining are in the 5-year expired phase during which they remain available for limited purposes.

[d]Disbursements are amounts paid by cash or cash equivalent during the fiscal year to liquidate obligations.

[e]Not applicable because the amounts have been canceled and are no longer available for any purpose unless Congress agrees to a reprogramming.

[f]Transfer is the shifting of all or part of the budget authority in one appropriation or fund account to another. DOD may transfer budget authority only as specifically authorized by law.

[g]This amount remains available for obligation.

Navy

Table 12 shows that for fiscal years 2005 through 2012, the Navy expended almost all of its MILCON appropriations. Specifically, the Navy expended at least 90 percent of its appropriations received each fiscal year for 2005 through 2011. Unexpended rates for amounts appropriated for fiscal years 2014 through 2016 vary and unobligated amounts for these years remain available for new obligations.

Table 12: Navy Military Construction Appropriations, Obligations, and Unexpended Balances, Fiscal Years 2005 through 2016

Dollars in millions

n/a	n/a	n/a	n/a	n/a	Unexpended funds				
Fiscal years of availability[a]	Total appropriation as of 9/30/2016[b] (dollars)	Total canceled as of 9/30/16[c] (dollars)	Disbursed as of 9/30/2016[d] (dollars)	Net obligations as of 9/30/2016 (dollars)	Transfer-red out as of fiscal year 2016[f] (dollars)	Unobligated as of 9/30/2016[g] (dollars)	Unliquidated obligations as of 9/30/2016 (dollars)	Total unexpended as of 9/30/2016 (dollars)	Unexpended rate (percentage)
2016-2020	1,721.2	n/a[c]	56.1	546.3	0.0	1,174.9	490.2	1,665.2	96.7
2015-2019	1,022.6	n/a[c]	204.5	699.7	2.5	320.4	495.2	818.1	80.0
2014-2018	1,634.1	n/a[c]	704.4	1,206.9	3.8	423.3	502.4	929.6	56.9
2013-2017	1,466.3	n/a[c]	1,012.6	1,251.4	3.6	211.3	238.8	453.6	30.9
2012-2016	2,078.0	n/a[c]	1,765.1	2,055.0	4.2	18.7	289.9	312.9	15.1
2011-2015	3,242.9	n/a[c]	2,948.5	3,226.1	1.1	15.6	277.6	294.4	9.1
2010-2014	3,427.4	n/a[c]	3,353.8	3,418.8	1.7	6.9	65.0	73.6	2.1
2009-2013	3,413.0	n/a[c]	3,374.7	3,395.1	0.9	17.0	20.4	38.3	1.1
2008-2012	2,281.0	n/a[c]	2,263.1	n/a[e]	21.0	n/a[e]	n/a[e]	17.9	0.8
2007-2011	1,146.9	1.1	1,142.5	n/a[e]	3.3	n/a[e]	n/a[e]	4.4	0.4
2006-2010	1,499.1	3.2	1,489.1	n/a[e]	6.8	n/a[e]	n/a[e]	10.0	0.7
2005-2009	1,042.1	3.7	1,036.4	n/a[e]	2.0	n/a[e]	n/a[e]	5.7	0.6

Source: GAO analysis of U.S. Treasury and Department of Defense data. Data reported as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]Range of fiscal years is the period of availability for MILCON amounts appropriated in each fiscal year from 2005 through 2016. MILCON appropriations are available for new obligations for 5 fiscal years.

[b]Includes the appropriated amount, net funds transferred into and amounts rescinded from the account as authorized by statute.

[c]Obligations are not applicable here because any amounts remaining are in the 5-year expired phase during which they remain available for limited purposes.

[d]Disbursements are amounts paid by cash or a cash equivalent during the fiscal year to liquidate obligations.

[e]Not applicable because the amounts have been canceled and are no longer available for any purpose.

[f]Transfer is the shifting of all or part of the budget authority in one appropriation or fund account to another account. DOD may transfer budget authority only as specifically authorized by law.

[g]This amount remains available for obligation.

Execution of Military Construction Appropriations

Tables 13 through 15 provide detailed information on budget execution for each active duty military department's MILCON appropriation for "congressionally directed" and "other" MILCON projects for fiscal years 2010 through 2016, as reported by DOD as of September 30, 2016.

Army

Table13 shows the obligations made by the Army for MILCON appropriations for fiscal years 2010 through 2016. We analyzed the obligations made during these appropriations' period of availability for congressionally directed and other MILCON projects. For fiscal year 2010, using data in the table, we found that about 97.2 percent of obligations were for congressionally directed projects and 2.8 percent were for other projects, as discussed above. In fiscal year 2011, about 94 percent of obligations were for congressionally directed projects and 4.2 percent were for other projects; and in fiscal year 2012, about 86.5 percent of obligations were for congressionally directed projects and 7.2 percent were for other projects.

Table 13: Budget Execution Analysis of Army Military Construction Projects, Fiscal Years 2010-2016, as of September 30, 2016

Dollars in millions

n/a	Fiscal years of availability						
Category	**2010-2014**	**2011-2015**	**2012-2016**	**2013-2017**	**2014-2018**	**2015-2019**	**2016-2020**
Total appropriated[a]	3,157	3,591	3,014	1,749	1,173	651	756
Obligations for congressionally directed projects	3,062	3,374	2,608	1,422	971	311	45
Obligations for other MILCON projects	87.2	151	216	24	29	18	98
Total obligated	3,149	3,525	2,824	1,446	1,000	329	143

Source: GAO analysis of U.S. Treasury and Department of Defense data. Data reported as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]Includes the appropriated amount, net funds transferred into and amounts rescinded from the account as authorized by statute.

Air Force

Table 14 shows the obligations made by the Air Force for MILCON appropriations for fiscal years 2010 through 2016. We analyzed the obligations made during these appropriations' period of availability for

congressionally directed and other MILCON projects. For fiscal year 2010, using the data listed in the table, we found that 90.5 percent of obligations were for congressionally directed projects and 7.3 percent were for other projects, as discussed above. In fiscal year 2011, about 84.3 percent of obligations were for congressionally directed projects and 12.9 percent were for other projects; and in fiscal year 2012, about 87.5 percent of obligations were for congressionally directed projects and 9.0 percent were for other projects.

Table 14: Budget Execution Analysis of Air Force Military Construction Projects for Fiscal Years 2010-2016, as of September 30, 2016

Dollars in millions

n/a	Fiscal years of availability						
Category	**2010-2014**	**2011-2015**	**2012-2016**	**2013-2017**	**2014-2018**	**2015-2019**	**2016-2020**
Total appropriated[a]	1,268	1,072	1,220	295	1,040	826	1,416
Obligations for congressionally directed projects	1,147	904	1067	273	923	637	384
Obligations for "other" MILCON projects	92	138	110	17	29	-4[b]	50
Total obligated	**1,239**	**1,042**	**1,177**	**290**	**952**	**633**	**434**

Source: GAO analysis of U.S. Treasury and Department of Defense data. Data reported as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]Includes the appropriated amount, net funds transferred into and amounts rescinded from the account as authorized by statute.

[b]Negative amount is the result of a foreign currency fluctuation transaction of $7.3 million.

Navy

Table 15 shows the obligations made by the Navy for MILCON appropriations for fiscal years 2010 through 2016. We analyzed the obligations made during these appropriations' period of availability for congressionally directed and other MILCON projects. For fiscal year 2010, using data in the table, we found that 84.7 percent of obligations were for congressionally directed projects and 15.0 percent were for other projects, as discussed above. In fiscal year 2011, about 87.7 percent of obligations were for congressionally directed projects and 11.8 percent were for other projects; and in fiscal year 2012, about 85.5 percent of obligations were for congressionally directed projects and 13.4 percent for other projects.

Table 15: Budget Execution Analysis of Navy Military Construction Projects, Fiscal Years 2010-2016, as of September 30, 2016

Dollars in millions

n/a	Fiscal years of availability						
Category	**2010-2014**	**2011-2015**	**2012-2016**	**2013-2017**	**2014-2018**	**2015-2019**	**2016-2020**
Total appropriated[a]	3,427	3,243	2,078	1,466	1,634	1,023	1,721
Obligations for congressionally directed projects	2,904	2,844	1,776	1,162	1,114	651	517
Obligations for other MILCON projects	515	382	279	89.2	93	49	30
Total obligated	**3,419**	**3,226**	**2,055**	**1,251**	**1,207**	**700**	**547**

Source: GAO analysis of U.S. Treasury and Department of Defense data. Data reported as of September 30, 2016. | GAO-18-101

Notes: Numbers may not total due to rounding.

[a]Includes the appropriated amount and net funds transferred into and amounts rescinded from the account as directed by statute.

Appendix III: Comparison of Completed Military Construction Projects' Initial Cost Estimates with Contract Award Amounts, Fiscal Years 2010 through 2016

This appendix provides information on our analysis of DOD's estimated initial costs and contract award amounts of projects that had been initiated and completed during fiscal year 2010 through fiscal year 2016 by the active component. An official from the Office of the Assistant Secretary of Defense for Energy, Installations, and Environment told us that, to determine whether initial cost estimates were over- or underestimated, a comparison between initial Form 1391 estimates and contract award amounts would be a valid approach since contract award amounts are, in general, estimates of the same requirements identified on a Form 1391. The official also noted that supervision, inspection, overhead, and contingency costs included on a Form 1391 are not included in contract award amounts, which could create differences between the Form 1391 cost estimates and contract award prices. Because of this, we excluded the supervision, inspection, overhead, and contingency costs from the Form 1391 estimates in the table below to eliminate those differences. Form 1391 cost estimates may also vary from contract award amounts for reasons such as changes in project size or scope, changes in project characteristics, unexpectedly high or low contractor bids, or differences in expected building material costs, among other things. A negative percent change from the Form 1391 estimate to the contract award amount indicates the estimated project cost was overestimated and a positive percent change indicates the project was underestimated. We did not determine the precise reasons for any differences between estimated costs and contract award amounts. Table 16 lists information on 414 completed projects funded with military construction (MILCON) appropriations during fiscal year 2010 through fiscal year 2016 sorted by largest percentage overestimated to largest percentage underestimated.

Table 16: Comparison of Completed MILCON Projects' Initial Cost Estimates with Contract Award Amounts, Fiscal Years 2010 through 2016

Dollars in thousands

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Army	Utah	Dugway Proving Ground	Water Treatment Systems	55206	22,240	7,052	-68
2011	Army	Washington	Fort Lewis	Rappelling Training Area	72089	4,730	1,598	-66
2011	Army	Kansas	Fort Riley	Automated Qualification Training Range	65460	13,388	4,697	-65
2010	Air Force	Afghanistan	Bagram Air Base	Passenger Terminal	ATUH100101	19,473	7,067	-64
2010	Army	Colorado	Fort Carson, Colorado	Brigade Complex	65362	62,406	25,514	-59
2010	Army	North Carolina	Sunny Point Military Ocean Terminal	Towers	61562	3,534	1,480	-58
2010	Army	Florida	Eglin Air Force Base	Non-Standard Small Arms Range	65694	3,082	1,328	-57
2010	Army	Florida	Eglin Air Force Base	Indoor Firing Range	65212	8,028	3,679	-54
2011	Army	Kentucky	Fort Campbell	Rappelling Training Area	67040	5,063	2,350	-54
2010	Army	Afghanistan	Bagram Air Base	Fuel System, Phase 6	69398	10,699	5,002	-53
2010	Army	Alaska	Fort Wainwright	Railhead Complex	61503	23,412	10,962	-53
2010	Army	Hawaii	Schofield Barracks	Vehicle Maintenance Shop	55281	32,460	15,366	-53
2011	Army	Kentucky	Fort Campbell	Urban Assault Course	71713	2,980	1,414	-53
2010	Army	Missouri	Fort Leonard Wood	Automated-Aided Instruction Facility	54253	24,240	11,599	-52
2010	Army	Florida	Eglin Air Force Base	Live Fire Exercise Breach Facility	65693	4,473	2,185	-51
2011	Air Force	Florida	Patrick Air Force Base	Air Force Technical Applications Center, Increment 1	SXHT053001	142,927	70,619	-51

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2012	Army	California	Fort Irwin	Infantry Squad Battle Course	71707	6,772	3,388	-50
2011	Navy	North Carolina	Camp Lejeune	Armory	P1323	11,070	5,941	-46
2010	Navy	Virginia	Norfolk Naval Station	E-2D Trainer Facility	P016	10,617	5,737	-46
2011	Army	Georgia	Fort Benning	Vehicle Maintenance Shop	63799	48,180	26,041	-46
2011	Army	Missouri	Fort Leonard Wood	Training Barracks	69267	17,331	9,457	-45
2012	Army	Georgia	Fort Benning	Training Barracks Complex, Phase 3	69745	20,275	11,091	-45
2011	Army	Kentucky	Fort Knox	Access Corridor Improvements	70261	5,365	2,976	-45
2010	Army	Georgia	Fort Benning	Combined Arms Collective Training Facility	62207	9,670	5,436	-44
2010	Army	Georgia	Fort Stewart	Warrior in Transition Complex	69391	43,932	24,822	-43
2010	Army	Florida	Eglin Air Force Base	Basic 10M - 25M Firing Range (Zero)	65706	2,738	1,552	-43
2010	Air Force	New Mexico	Kirtland Air Force Base	Hc-130J Simulator Facility	MHMV083112	7,835	4,450	-43
2012	Army	Kentucky	Fort Campbell	Scout/Recce Gunnery Range	71703	16,211	9,236	-43
2010	Army	Kansas	Fort Riley	Igloo Storage, Installation	64570	6,533	3,724	-43
2012	Air Force	Nevada	Nellis Air Force Base	F-35 Age Facility	RKMF103001	19,441	11,097	-43
2010	Army	Colorado	Fort Carson, Colorado	Commissary	72258	32,077	18,715	-42
2010	Army	Florida	Eglin Air Force Base	Live Fire Exercise Shoothouse	65691	7,183	4,213	-41
2011	Army	Hawaii	Tripler Army Medical Center	Barracks	67258	25,479	14,980	-41
2010	Air Force	Italy	Sigonella Naval Air Station	Global Hawk Aircraft Maintenance And Operations Complex	USAFE073006	27,930	16,487	-41

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2010	Air Force	Florida	MacDill Air Force Base	Child Development Center	NVZR073723	6,308	3,733	-41
2011	Air Force	Alaska	Elmendorf Air Force Base	F-22 Adal Weapons Release Systems Shop	FXSB073012	9,399	5,608	-40
2010	Air Force	Colorado	U.S. Air Force Academy	Addition to Cadet Fitness Center	XQPZ104004	15,849	9,512	-40
2012	Army	Hawaii	Fort Shafter	Child Development Center	64967	15,854	9,573	-40
2011	Air Force	New Mexico	Kirtland Air Force Base	Armament Shop	MHMV053114A	5,844	3,548	-39
2010	Army	New York	Fort Drum	Barracks	64522	51,488	31,303	-39
2011	Army	Virginia	Fort Lee	Automated Qualification Training Range	60449	6,960	4,237	-39
2010	Army	Florida	Eglin Air Force Base	Automated Qualification Training Range	65701	10,828	6,638	-39
2010	Air Force	Arizona	Davis-Monthan Air Force Base	Hc-130J Rescue Squadron Operations Facility	FBNV103002	7,853	4,868	-38
2011	Army	Virginia	Fort A.P. Hill	Light Demolition Range	65790	3,710	2,308	-38
2010	Army	Virginia	Fort A.P. Hill	Training Aids Center	68779	8,238	5,148	-38
2010	Army	Arizona	Fort Huachuca	UAV ER/MPER/MP	62363	13,790	8,618	-38
2010	Army	North Carolina	Fort Bragg	Simulations Center	20347	45,395	28,720	-37
2011	Navy	Washington	Kitsap Naval Base	Waterfront Restricted Area Emergency Power	P910	22,533	14,316	-36
2011	Air Force	Colorado	Peterson Air Force Base	Raiders Space Control Facility	TDKA093005	22,434	14,284	-36
2010	Navy	North Carolina	Camp Lejeune (Hadnot Point)	Physical Fitness Center	P1160	35,960	22,908	-36

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2010	Air Force	Arizona	Davis-Monthan Air Force Base	Hc-130J Simulator Facility	FBNV103001	7,595	4,852	-36
2011	Navy	Virginia	Norfolk Naval Station	Piers 9 And 10 Upgrades for Building 1000	P828	2,160	1,396	-35
2010	Air Force	Wyoming	F.E. Warren Air Force Base	Add/Alter Missile Service Complex	GHLN053010	8,148	5,273	-35
2012	Air Force	Utah	Hill Air Force Base	F-22 System Support Facility	KRSM123011R	14,753	9,598	-35
2010	Army	Virginia	Fort A.P. Hill	Field Training Area	67973	8,068	5,252	-35
2010	Army	Georgia	Fort Benning	Warrior in Transition Complex	69999	48,348	31,496	-35
2010	Air Force	Florida	MacDill Air Force Base	Central Command Commandant Facility	NVZR103704R1	13,782	9,028	-34
2010	Air Force	Qatar	Al Udeid Air Base	Blatchford-Preston Complex	ALUA073006A	54,057	35,759	-34
2012	Army	Kentucky	Fort Campbell	Unmanned Aerial Vehicle Maintenance Hangar	69501	61,057	40,397	-34
2010	Army	Hawaii	Schofield Barracks	Vehicle Maintenance Shop	55274	56,988	37,872	-34
2012	Army	Kentucky	Fort Knox	Automated Infantry Platoon Battle Course	64823	6,300	4,197	-33
2010	Army	Hawaii	Schofield Barracks	Warrior in Transition Barracks	69521	49,090	32,745	-33
2011	Air Force	Nevada	Creech Air Force Base	UAS Airfield Fire/Crash Rescue Station	LKTC113102	10,591	7,091	-33
2011	Air Force	Florida	Eglin Air Force Base	F-35 Fuel Cell Maintenance Hangar	FTFA073908	10,351	6,957	-33
2010	Navy	North Carolina	Cherry Point Marine Corps Air Station	Emergency Medical Services/Fire Vehicle Facility	P141	9,590	6,460	-33

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2010	Army	Texas	Fort Hood	Automated Multipurpose Machine Gun Range	71692	6,034	4,070	-33
2012	Army	Korea	Camp Henry	Barracks Complex	76235	42,484	28,682	-32
2010	Army	Alaska	Fort Richardson	Warrior in Transition Complex	71540	39,058	26,452	-32
2011	Army	South Carolina	Fort Jackson	Trainee Barracks	73299	25,011	16,984	-32
2012	Army	California	Fort Irwin	Qualification Training Range	70517	14,051	9,599	-32
2010	Air Force	New Mexico	Kirtland Air Force Base	Mc-130J Simulator Facility	MHMV073110	7,239	4,946	-32
2010	Air Force	Texas	Goodfellow Air Force Base	Joint Intel Technical Training Facility, Phase 1	JCGU053000	16,584	11,387	-31
2010	Air Force	Texas	Lackland Air Force Base	Recruit Dormitory 2, Phase 2	MPLS083737R2	69,405	47,773	-31
2010	Air Force	Arizona	Davis-Monthan Air Force Base	Dormitory	FBNV073004	18,020	12,544	-30
2011	Air Force	Arizona	Davis-Monthan Air Force Base	HC-130J Parts Store	FBNV103005	7,416	5,195	-30
2010	Air Force	Florida	Macdill Air Force Base	Dormitory	NVZR063708	14,394	10,095	-30
2012	Air Force	Guam	Andersen Air Force Base	Combat Communications Combat Support	SAKW101001	8,815	6,212	-30
2011	Air Force	United Kingdom	Royal Air Force Mildenhall	Extend Taxiway Alpha	QFQE063007	13,983	9,900	-29
2011	Army	Texas	Fort Hood	Battalion Complex	71462	35,597	25,269	-29
2010	Army	Georgia	Fort Benning	Battle Lab	65250	26,654	19,000	-29
2011	Army	Kansas	Fort Riley	Known Distance Range	65171	6,527	4,654	-29
2011	Army	Georgia	Fort Gordon	Training Aids Center	70307	3,761	2,696	-28
2012	Air Force	Korea	Osan Air Base	Dormitory	SMYU123002	20,634	14,839	-28
2011	Army	New York	Fort Drum	Battalion Complex	67045	55,517	40,139	-28

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2011	Air Force	New Mexico	Cannon Air Force Base	UAS Squadron Ops Facility	CZQZ093004	18,149	13,126	-28
2010	Army	Texas	Fort Bliss	Brigade Staging Area Complex	61588	13,448	9,760	-27
2010	Army	Georgia	Fort Gillem	Forensic Lab	66011	9,646	7,034	-27
2013	Army	Kentucky	Fort Knox	Automated Infantry Squad Battle Course	05924	5,365	3,918	-27
2011	Air Force	Nevada	Nellis Air Force Base	F-35 Flight Simulator Facility	RKMF103007	11,860	8,725	-26
2011	Army	New York	Fort Drum	Training Aids Center	14456	16,847	12,412	-26
2010	Army	Texas	Fort Bliss	Vehicle Maintenance Shop	55361	14,490	10,689	-26
2010	Air Force	Colorado	Peterson Air Force Base	National Security Space Institute	TDKA074036B	17,910	13,234	-26
2011	Army	North Carolina	Fort Bragg	Vehicle Maintenance Shop	67107	25,664	18,964	-26
2010	Army	Missouri	Fort Leonard Wood	Wheeled Vehicle Drivers Course	69663	15,691	11,599	-26
2010	Navy	Florida	Mayport Naval Station	Channel Dredging	P187	41,993	31,174	-26
2010	Army	North Carolina	Fort Bragg	Vehicle Maintenance Shop	20807	15,784	11,795	-25
2011	Air Force	Texas	Lackland Air Force Base	Recruit Dormitory, Phase 3	MPLS083737R3	61,315	45,885	-25
2010	Army	Texas	Fort Bliss	Digital Multipurpose Range Complex	63879	40,636	30,442	-25
2012	Air Force	Nevada	Nellis Air Force Base	F-35 Add/Alter Engine Shop	RKMF103010	2,492	1,867	-25
2010	Army	Texas	Fort Bliss	Simulation Center	72169	20,397	15,282	-25
2011	Air Force	Colorado	Buckley Air Force Base	Security Forces Operations Facility	CRWU073004	10,994	8,274	-25
2012	Air Force	Virginia	Joint Base Langley-Eustis	Advanced Individual Training Barracks Complex, Phase 2	WACC120007	45,062	33,915	-25
2013	Army	Kentucky	Fort Campbell	Live Fire Exercise Shoothouse	71712	3,423	2,581	-25

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2011	Army	Texas	Fort Bliss	Company Operations Facilities	72149	16,571	12,510	-25
2011	Army	Alabama	Fort Rucker	Aviation Component Maintenance Shop	60463	26,109	19,713	-24
2012	Air Force	Guam	Andersen Air Force Base	Red Horse Cantonment Operations Facility	SAKW059101	12,567	9,491	-24
2011	Air Force	Florida	Hurlburt Field	Base Logistics Facility	FTEV043016	21,663	16,386	-24
2012	Army	Germany	Grafenwoehr	Convoy Live Fire Range	65129	4,473	3,407	-24
2012	Army	Korea	Camp Carroll	Barracks	72650	36,221	27,593	-24
2011	Army	Georgia	Fort Stewart	Training Aids Center	72190	6,349	4,837	-24
2011	Air Force	New Mexico	Holloman Air Force Base	UAS Maintenance Hangar	KWRD093013	13,454	10,254	-24
2010	Air Force	Hawaii	Wheeler Aaf	Air Support Operations Center Complex	YVEW083003	13,424	10,260	-24
2010	Army	Washington	Fort Lewis	Modified Record Fire Range	66531	3,678	2,815	-23
2013	Army	Georgia	Fort Stewart	Automated Combat Pistol Qualification Course	67019	3,281	2,515	-23
2010	Army	Japan	Okinawa	Training Aids Center	71118	5,370	4,129	-23
2010	Air Force	Florida	Eglin Air Force Base	Construct Dormitory	FTFA053025	9,907	7,635	-23
2011	Army	Kentucky	Fort Campbell	Vehicle Maintenance Shop	64295	14,108	10,907	-23
2012	Air Force	Arizona	Davis-Monthan Air Force Base	EC-130H Simulator/Training Operations	FBNV103006P1	18,551	14,348	-23
2011	Air Force	Nevada	Nellis Air Force Base	F-35 Maintenance Hangar	RKMF093004	25,910	20,049	-23
2011	Army	North Carolina	Fort Bragg	Student Barracks	73930	16,434	12,754	-22
2013	Navy	North Carolina	Camp Lejeune	Base Access And Road, Phase 3	P1384	36,854	28,666	-22

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2011	Army	Kentucky	Fort Campbell	Brigade Complex	58511	60,925	47,497	-22
2010	Army	North Carolina	Fort Bragg	Vehicle Maintenance Shop	16992	17,548	13,745	-22
2011	Army	Georgia	Fort Stewart	Automated Multipurpose Machine Gun Range	72188	8,223	6,458	-21
2011	Air Force	Italy	Aviano Air Base	Air Support Operations Squadron Facility	ASHE083011	9,122	7,174	-21
2011	Army	Kansas	Fort Riley	Battalion Complex, Phase 1	65714	28,373	22,328	-21
2010	Army	California	Fort Irwin	MOUT Assault Course, Phase 4	64645	8,581	6,755	-21
2011	Air Force	Italy	Aviano Air Base	Dormitory (144 Room)	ASHE123000	17,150	13,505	-21
2012	Air Force	Guam	Andersen Air Force Base	Combat Communications Transmission System	SAKW091002	5,024	3,960	-21
2010	Army	Japan	Sagamihara	Training Aids Center	71117	5,324	4,239	-20
2012	Air Force	Kansas	Fort Riley	Air Support Operations Center	HACC123302	6,876	5,475	-20
2011	Army	Florida	Eglin Air Force Base	Chapel	71492	6,267	4,992	-20
2010	Army	Georgia	Fort Benning	Dining Facility	69151	13,485	10,777	-20
2010	Air Force	Idaho	Mountain Home Air Force Base	Logistics Readiness Center	QYZH013005R3	18,396	14,730	-20
2011	Army	Kentucky	Fort Campbell	Company Operations Facilities	60155	22,969	18,397	-20
2010	Air Force	Virginia	Langley Air Force Base	West and LaSalle Gates Force Protection/Access	MUHJ053008	8,969	7,186	-20
2010	Army	North Carolina	Fort Bragg	Transient Training Barracks Complex	65876	14,969	12,005	-20

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2014	Air Force	Arizona	Luke Air Force Base	F-35 Squadron Operations/Aircraft Maintenance Unit #3	NUEX093011	19,344	15,514	-20
2010	Navy	North Carolina	Camp Lejeune	Military Police Working Dog Kennel - Relocation	P1304	7,570	6,073	-20
2010	Army	Texas	Fort Hood	Vehicle Maintenance Shop	22772	20,952	16,830	-20
2010	Navy	Hawaii	Pearl Hair Base	Missile Magazines (5), West Loch	P182	20,177	16,224	-20
2010	Air Force	California	Travis Air Force Base	Construct Kc-10 Cargo Load Training Facility	XDAT083002	6,213	4,999	-20
2011	Army	Kansas	Fort Riley	Automated Infantry Squad Battle Course	71696	3,711	2,988	-19
2010	Army	Arkansas	Pine Bluff Arsenal	Fuse and Detonator Magazine, Depot Level	67106	22,808	18,457	-19
2010	Air Force	Texas	Lackland Air Force Base	Basic Military Training Satellite Classroom/Dining Facility	MPLS083737S1	29,016	23,484	-19
2010	Air Force	Guam	Andersen Air Force Base	Electrical Infrastructure	AJJY336449	30,258	24,520	-19
2014	Air Force	Nevada	Nellis Air Force Base	Add RPA Weapons School Facility	RKMF113005	18,406	14,923	-19
2010	Army	South Carolina	Fort Jackson	Advanced Skills Trainee Barracks	31354	29,341	23,793	-19
2010	Army	Florida	Eglin Air Force Base	Anti-Armor, Tracking and Live Fire Range	65700	3,063	2,490	-19
2011	Army	Virginia	Fort Eustis	Warrior in Transition Complex	71539	16,071	13,074	-19
2010	Air Force	Oklahoma	Tinker Air Force Base	Building 3001 Hangar Door	WWYK083003A	11,747	9,560	-19
2010	Navy	Florida	Pensacola Naval Air Station	Corry A School Bachelor Enlisted Quarters	P724	20,760	16,930	-18
2010	Army	Korea	Camp Humphreys	Fire Stations	60783	11,879	9,688	-18

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2011	Air Force	Florida	Hurlburt Field	Adal Special Operations School Facility	FTEV023013	5,560	4,536	-18
2012	Army	Kansas	Forbes Air Field	Deployment Support Facility	59148	4,747	3,901	-18
2011	Air Force	New York	Fort Drum	20th Air Support Operations Squadron Complex	WACC073020	18,486	15,197	-18
2010	Army	Florida	Eglin Air Force Base	Urban Assault Course	65698	2,424	1,993	-18
2011	Army	Colorado	Fort Carson	Brigade Complex	67137	50,620	41,670	-18
2011	Air Force	New Jersey	McGuire Air Force Base	Dormitory (120 Rm)	PTFL083003	16,682	13,772	-17
2012	Army	Alabama	Fort Rucker	Combat Readiness Center	65429	10,533	8,698	-17
2012	Army	South Carolina	Fort Jackson	Trainee Barracks Complex, Phase 2	62955	53,599	44,267	-17
2011	Army	Alabama	Fort Rucker	Training Aids Center	70234	4,208	3,485	-17
2011	Air Force	Virginia	Langley Air Force Base	F-22 Hangar Bay	MUHJ063017	7,961	6,595	-17
2010	Army	Texas	Fort Sam Houston	General Instruction Building	64221	8,104	6,721	-17
2010	Army	Florida	Eglin Air Force Base	Light Demolition Range	65705	2,192	1,819	-17
2011	Army	Honduras	Soto Cano Air Base	Barracks	61383	18,243	15,147	-17
2011	Air Force	Nevada	Nellis Air Force Base	F-35 Test Evaluation Squadron Facility	RKMF103002	7,119	5,912	-17
2012	Army	Kentucky	Fort Campbell	Vehicle Maintenance Facility	18646	14,630	12,241	-16
2010	Air Force	California	Vandenberg Air Force Base	Child Development Center	XUMU003000	11,678	9,777	-16
2013	Army	Kentucky	Fort Campbell	Unmanned Ariel Vehicle Complex	76239	20,284	16,983	-16
2011	Air Force	Alabama	Maxwell Air Force Base	Adal Air University Library	PNQS983126	12,130	10,211	-16

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2011	Army	Virginia	Fort Lee	Company Operations Facility	73298	4,452	3,750	-16
2011	Army	North Carolina	Fort Bragg	Brigade Complex	53555	45,400	38,249	-16
2012	Air Force	Texas	Joint Base San Antonio	Advanced Individual Training Barracks	MPLS11473JB	41,301	34,889	-16
2010	Air Force	Texas	Dyess Air Force Base	C-130J Hangar	FNWZ100006	4,050	3,422	-16
2014	Air Force	Nevada	Nellis Air Force Base	F-35 Parts Store	RKMF103006	8,240	6,974	-15
2010	Navy	Florida	Whiting Field	T-88 Joint Primary Aircraft Training System Operations Paraloft Facility	P273	3,730	3,168	-15
2012	Air Force	North Carolina	Pope Air Force Base	C-130 Flight Simulator	TMKH083003	5,450	4,630	-15
2010	Air Force	Germany	Spangdahlem Air Base	Fitness Center	VYHK043100	21,022	17,881	-15
2011	Navy	Florida	Blount Island Marine Corps Support Facility	Consolidated Warehouse Facility	P022	15,610	13,295	-15
2012	Air Force	Arizona	Luke Air Force Base	F-35 Squad Operations	AETC120011	16,146	13,766	-15
2010	Air Force	Guam	Andersen Air Force Base	NW Field ATFP Perimeter Fence and Road	SAKW103002	4,280	3,650	-15
2010	Army	Texas	Fort Bliss	Fire and Military Police Stations	64608	14,712	12,566	-15
2011	Air Force	South Carolina	Charleston Air Force Base	Civil Engineer Complex, Phase 1	DKFX913001P1	13,615	11,649	-14
2011	Army	Texas	Fort Hood	Company Operations Facilities	71465	3,894	3,338	-14
2011	Air Force	North Dakota	Minot Air Force Base	Control Tower/Base Operations Facility	QJVF012002	16,912	14,560	-14
2011	Army	Missouri	Fort Leonard Wood	Transient Advanced Trainee Barracks, Phase 2	68721	26,618	22,933	-14

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2011	Army	North Carolina	Fort Bragg	Company Operations Facilities	65204	11,435	9,878	-14
2013	Navy	Virginia	Yorktown Naval Weapons Station	Supply Warehouse Facility	P987	8,079	6,987	-14
2011	Army	Virginia	Fort A.P. Hill	Known Distance Range	65792	3,441	2,979	-13
2011	Air Force	Florida	Hurlburt Field	Add to Visiting Quarters	FTEV023010	4,054	3,516	-13
2011	Army	Texas	Fort Bliss	THAAD Battery Complex	74635	15,607	13,550	-13
2010	Army	Texas	Fort Bliss	Aircraft Fuel Storage	64639	9,709	8,434	-13
2011	Air Force		Andersen Air Force Base	Guam Strike South Ramp Utilities, Phase 1	AJJY336509	10,999	9,582	-13
2012	Army	Kentucky	Fort Campbell	Barracks Complex	72684	58,405	50,996	-13
2011	Air Force	New Mexico	Kirtland Air Force Base	H/Mc-130 Fuel System Maintenance Facility	MHMV083114	12,792	11,178	-13
2012	Air Force	Texas	Joint Base San Antonio	Recruit Dormitory 4, Phase 4	MPLS083737R4	57,720	50,529	-12
2010	Army	Texas	Fort Bliss	Scout Gunnery Complex	72165	15,485	13,562	-12
2013	Army	Georgia	Fort Gordon	Modified Record Fire Range	61498	3,599	3,164	-12
2012	Navy	North Carolina	Camp Lejeune	Base Entry Point And Road	P1383	72,988	64,235	-12
2011	Air Force	Nevada	Nellis Air Force Base	F-35 422 Flight Test Instrumentation Facility	RKMF103008	1,710	1,508	-12
2011	Air Force	New Mexico	Kirtland Air Force Base	Aerial Delivery Facility Addition	MHMV083118	3,439	3,036	-12
2012	Air Force	New Mexico	Holloman Air Force Base	F-16 Parallel Taxiway 07/25	KWRD083007	7,185	6,349	-12

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2012	Air Force	Arizona	Luke Air Force Base	F-35 Aircraft Maintenance Unit	AETC120010	5,404	4,781	-12
2012	Army	Kentucky	Fort Campbell	Vehicle Maintenance Facility	64297	36,239	32,080	-11
2010	Army	Korea	Camp Humphreys	Vehicle Maintenance Shop	56656	16,899	14,981	-11
2011	Army	Virginia	Fort Lee	Training Aids Center	71114	5,291	4,700	-11
2014	Army	North Carolina	Fort Bragg	Command And Control Facility	69624	5,312	4,720	-11
2011	Army	Missouri	Fort Leonard Wood	Information Systems Facility	64520	14,154	12,605	-11
2011	Air Force	Germany	Ramstein Air Base	Construct C-130J Flight Simulator Facility	TYFR123063	7,870	7,024	-11
2012	Air Force	Nevada	Nellis Air Force Base	Communications Network Control Center	RKMF103003	10,449	9,327	-11
2013	Air Force	Arkansas	Little Rock Air Force Base	C-130J Fuel Systems Maintenance Hangar	NKAK103006	23,226	20,869	-10
2010	Army	Texas	Fort Bliss	Light Demolition Range	72167	2,153	1,935	-10
2011	Air Force	Texas	Lackland Air Force Base	Satellite Classroom/Dining Facility Number 2	MPLS083737S2	28,847	26,018	-10
2010	Air Force	Ohio	Wright-Patterson Air Force Base	Information Technology Complex, Phase 1	ZHTV053204	24,351	21,970	-10
2013	Army	Texas	Fort Hood	Unmanned Aerial Vehicle Complex	80113	19,374	17,485	-10
2010	Navy	South Carolina	Beaufort	Widebody Aircraft Fuel Lane	P441	1,150	1,038	-10
2010	Army	Korea	Camp Humphreys	Vehicle Maintenance Shop	58399	15,955	14,432	-10
2012	Army	North Carolina	Fort Bragg	Non-Commissioned Officer Academy	43335	38,272	34,647	-9

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Air Force	New Mexico	Cannon Air Force Base	Consolidated Communication Facility	CZQZ063002	13,582	12,305	-9
2011	Air Force	Guam	Andersen Air Force Base	Combat Communications Operations Facility	SAKW123002	8,317	7,548	-9
2011	Air Force	Guam	Andersen Air Force Base	Red Horse Headquarters/Engineering Facility	SAKW091006	7,201	6,538	-9
2012	Air Force	North Dakota	Minot Air Force Base	Dormitory	QJVF092001	19,565	17,775	-9
2012	Air Force	Guam	Andersen Air Force Base	Guam Strike Conventional Munitions Maintenance	AJJY123011	10,530	9,586	-9
2011	Army	Colorado	Fort Carson	Automated Sniper Field Fire Range	41917	3,288	2,998	-9
2013	Navy	Florida	Jacksonville Naval Air Station	Mission Control Complex	P655	19,880	18,180	-9
2011	Air Force	Wyoming	Camp Guernsey	Nuclear/Space Security Tactics Training Center	AFSPC053012	4,203	3,854	-8
2011	Army	Alabama	Fort Rucker	Aviation Maintenance Facility	60459	32,242	29,576	-8
2012	Air Force	California	Travis Air Force Base	Dormitory	XDAT083003	20,132	18,492	-8
2010	Air Force	Guam	Andersen Air Force Base	Field Combat Support Vehicle Maintenance Facility	SAKW059100	14,078	12,960	-8
2012	Air Force	New Mexico	Cannon Air Force Base	Dormitory	CZQZ123001	13,529	12,463	-8
2011	Army	Florida	Miami-Dade County (Homestead Air Reserve Base)	Command and Control Facility	61533	37,448	34,554	-8
2013	Air Force	New Mexico	Holloman Air Force Base	Maintenance Hangar	KWRD123004	22,284	20,620	-7

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2011	Army	Kentucky	Fort Campbell	Unit Operations Facilities	64298	23,868	22,114	-7
2010	Air Force	Guam	Andersen Air Force Base	Commando Warrior Operations Facility	SAKW053006	3,766	3,490	-7
2010	Air Force	Texas	Goodfellow Air Force Base	Student Dormitory	JCGU083001	12,614	11,692	-7
2012	Air Force	Washington	Fairchild Air Force Base	SERE Force Support, Phase 2	GJKZ920012P2	12,625	11,724	-7
2011	Army	New York	Fort Drum	Transient Training Barracks	57712	49,982	46,428	-7
2011	Air Force	New Jersey	McGuire Air Force Base	Base Operations/Command Post Facility	PTFL063000	7,220	6,714	-7
2011	Air Force	Germany	Vilseck	Air Support Operations Squadron Complex	VILS093001	11,536	10,734	-7
2010	Army	Colorado	Fort Carson, Colorado	Scout/Recce Gunnery Complex	72172	14,397	13,414	-7
2010	Air Force	Ohio	Wright-Patterson Air Force Base	Conversion for Advanced Power Thermal Research Lab	ZHTV063301	19,162	17,884	-7
2012	Air Force	New Mexico	Kirtland Air Force Base	Sustainment Center	MHMV093108	22,611	21,110	-7
2012	Army	Kentucky	Fort Knox	Battalion Complex	65293	43,760	40,887	-7
2011	Army	Alaska	Fort Richardson	Multipurpose Machine Gun Range	73811	10,990	10,272	-7
2010	Army	Texas	Fort Bliss	Known Distance Range	72163	4,302	4,022	-7
2011	Army	Texas	Fort Bliss	Vehicle Bridge Overpass	64604	7,882	7,377	-6
2012	Air Force	New Mexico	Holloman Air Force Base	F-16 Academic Facility	KWRD113005	5,315	4,990	-6
2010	Air Force	New Mexico	Holloman Air Force Base	F-22A Consolidated Munitions Maintenance	KWRD083003	4,990	4,690	-6
2011	Army	Georgia	Fort Stewart	General Instruction Building	71125	7,441	6,998	-6

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Air Force	Arkansas	Little Rock Air Force Base	C-130 Flight Simulator Addition	NKAK103003	5,181	4,886	-6
2011	Army	Louisiana	Fort Polk	Barracks	60130	25,787	24,390	-5
2013	Army	Oklahoma	Fort Sill	Modified Record Fire Range	67037	4,395	4,160	-5
2011	Army	Virginia	Fort A.P. Hill	MOUT Collective Training Facility	65726	58,646	55,547	-5
2012	Air Force	Guam	Andersen Air Force Base	Air Freight Terminal Complex	AJJY983202	31,679	30,047	-5
2010	Army	Texas	Fort Bliss	Automated Multipurpose Machine Gun Range	72164	6,202	5,890	-5
2014	Air Force	Nevada	Nellis Air Force Base	F-35 Fuel Cell Hangar	RKMF103009	8,485	8,066	-5
2010	Army	Afghanistan	Bagram Air Base	Aviation Support Facility	72095	2,318	2,210	-5
2011	Army	Missouri	Fort Leonard Wood	Brigade Headquarters	72055	11,070	10,563	-5
2010	Army	Kansas	Fort Riley	Advanced Waste Water Treatment Plant	64568	25,466	24,306	-5
2012	Army	Kentucky	Fort Campbell	Physical Fitness Facility	65147	16,955	16,199	-4
2011	Navy	Hawaii	Pearl Harbor Naval Station	Center For Disaster Management/Humanitarian Assistance	P056	8,220	7,857	-4
2011	Army	North Carolina	Fort Bragg	Staging Area Complex	57836	13,185	12,615	-4
2011	Air Force	New Mexico	Holloman Air Force Base	UAS Maintenance Hangar	KWRD093016	20,370	19,498	-4
2010	Navy	Florida	Eglin Air Force Base	Bachelor Enlisted Quarters, EOD School, Phase 2	P925	23,777	22,769	-4
2010	Army	Georgia	Fort Stewart	Automated Sniper Field Fire Range	67027	3,085	2,961	-4
2010	Air Force	Turkey	Incirlik Air Base	Consolidated Community Center	LJYC003006	8,211	7,881	-4
2010	Army	Colorado	Fort Carson	Railroad Tracks	65616	12,601	12,095	-4
2011	Army	Texas	Fort Bliss	Indoor Swimming Pool	57434	14,155	13,606	-4

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Army	Hawaii	Schofield Barracks	Warrior in Transition Complex	71553	27,364	26,340	-4
2010	Air Force	Arizona	Davis-Monthan Air Force Base	Hc-130J Infrastructure	FBNV103003	4,309	4,150	-4
2012	Air Force	New Mexico	Holloman Air Force Base	Child Development Center	KWRD013003	10,212	9,844	-4
2012	Air Force	Missouri	Whiteman Air Force Base	WSA Security Control Facility	YWHG071005	4,326	4,173	-4
2010	Air Force	Germany	Ramstein Air Base	Contingency Response Group Command	TYFR0530402	20,744	20,023	-3
2010	Air Force	Utah	Hill Air Force Base	F-22A Radar Cross Section Testing Facility	KRSM043003	19,050	18,401	-3
2011	Army	South Carolina	Fort Jackson	Training Aids Center	71119	15,523	15,000	-3
2012	Air Force	New Mexico	Holloman Air Force Base	F-16 Training Facility	KWRD113010	3,739	3,614	-3
2011	Army	South Carolina	Fort Jackson	Trainee Barracks Complex 3, Phase 1	53794	41,832	40,499	-3
2010	Air Force	Florida	Hurlburt Field	Refueling Vehicle Maintenance Facility	FTEV043000	1,982	1,920	-3
2011	Air Force	Louisiana	Barksdale Air Force Base	Weapons Load Crew Training Facility	AWUB025502	16,408	15,903	-3
2011	Army	Maryland	Aberdeen Proving Ground	Automotive Technology Evaluation Facility, Phase 2	66918	13,236	12,847	-3
2011	Army	Afghanistan	Bagram Air Base	Entry Control Point	71606	6,673	6,491	-3
2012	Air Force	North Dakota	Minot Air Force Base	B - 52 3-Bay Conventional Munitions Maintenance	QJVF092010	10,746	10,490	-2
2011	Air Force	Texas	Lackland Air Force Base	One-Company Fire Station	MPLS116414JB	4,962	4,845	-2
2011	Air Force	New Mexico	Cannon Air Force Base	Dormitory	CZQZ073005	12,697	12,413	-2

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2014	Air Force	Arizona	Luke Air Force Base	F-35 Field Training Detachment	NUEX093007	4,806	4,700	-2
2012	Air Force	Washington	Fairchild Air Force Base	Wing Headquarters	GJKZ860009	12,213	11,957	-2
2011	Air Force	Korea	Kunsan Air Base	DMT Flight Simulator Facility	MLWR093183	6,703	6,568	-2
2011	Air Force	Arizona	Davis-Monthan Air Force Base	HC-130 Age Maintenance Facility	FBNV113007	4,161	4,078	-2
2010	Army	Alaska	Fort Richardson	Airborne Sustainment Training Complex	62835	5,458	5,356	-2
2010	Navy	California	Camp Pendleton	Expansion of Southern Region Tertiary Treatment Plant	P1041	52,070	51,114	-2
2012	Navy	California	Camp Pendleton	Armory, 1st Marine Division	P532	11,396	11,201	-2
2012	Army	South Carolina	Fort Jackson	Modified Record Fire Range	67022	4,451	4,375	-2
2011	Air Force	Arizona	Davis-Monthan Air Force Base	Hangar	FBNV063501	22,648	22,282	-2
2011	Army	Washington	Fort Lewis	Barracks Complex	55198	36,548	35,958	-2
2013	Air Force	Georgia	Fort Stewart	Air Support Operations Center	ACC123184	6,561	6,458	-2
2011	Army	North Carolina	Fort Bragg	Dining Facility	74987	10,160	10,010	-1
2013	Air Force	Utah	Hill Air Force Base	F-35 Modular Storage Magazines	KRSM103030	2,055	2,028	-1
2014	Air Force	Kentucky	Fort Campbell	19th Air Support Operations Squadron Expansion	ACC123183	7,210	7,143	-1
2010	Air Force	North Dakota	Minot Air Force Base	Missile Procedures Training Operations	QJVF962007R2	9,010	8,930	-1
2012	Air Force	Guam	Andersen Air Force Base	Guam Strike Clear Water Rinse Facility	AJJY123009	6,798	6,739	-1
2010	Air Force	Alaska	Elmendorf Air Force Base	F-22 Weapons Load Training Facility	FXSB073022	11,302	11,231	-1

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Air Force	Alaska	Elmendorf Air Force Base	F-22 Weapons Load Training Facility	FXSB073022	11,302	11,231	-1
2011	Army	Kansas	Fort Leavenworth	Vehicle Maintenance Shop	73808	6,446	6,418	0
2010	Navy	Hawaii	Pearl Hair Base	Asia Pacific Center for Security Studies Conference and Technology Learning Center	P004	11,475	11,432	0
2011	Air Force	Alaska	Elmendorf Air Force Base	Add/Alter Training Facility	FXSB123201	4,248	4,237	0
2011	Navy	North Carolina	Camp Lejeune	Maintenance/Ops Complex - 2nd Anglico	P1240	32,650	32,625	0
2012	Army	Oklahoma	Fort Sill	Battle Command Training Center	64815	20,726	20,720	0
2015	Air Force	Guam	Joint Region Marianas	Red Horse Logistics Facility	SAKW059006	2,842	2,842	0
2010	Army	Afghanistan	Bagram Air Base	Fuel System, Phase 7	69403	4,446	4,447	0
2013	Air Force	Florida	Tyndall Air Force Base	F–22 Hangar For Low Observable/Compo site	XLWU103002	13,285	13,299	0
2013	Navy	Washington	Whidbey Island Naval Air Station	Ea-18G Flight Simulator Facility	P245	5,672	5,679	0
2011	Air Force	Oklahoma	Tinker Air Force Base	Upgrade Building 3001 Infrastructure, Phase 3	WWYK083003B	12,667	12,687	0
2013	Air Force	Georgia	Moody Air Force Base	Hc-130J Simulator Facility	QSEU103008	7,675	7,692	0
2011	Air Force	Colorado	Air Force Academy	Center for Character and Leadership Development	XQPZ084017	24,870	24,996	1
2011	Air Force	District of Columbia	Bolling Air Force Base	Joint Air Defense Operations Center	BXUR105000	11,893	11,978	1
2010	Army	New York	Fort Drum	Water System Expansion	59247	5,840	5,883	1

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2011	Navy	California	San Diego Naval Base	Berthing Pier 12 Replacement and Dredging, Phase 1	P327	98,064	99,133	1
2011	Navy	Florida	Blount Island Marine Corps Support Facility	Washrack Expansion	P023	8,770	8,878	1
2011	Army	Texas	Fort Bliss	Digital Multipurpose Training Range	72182	20,249	20,521	1
2010	Army	South Carolina	Fort Jackson	Infiltration Course	72369	1,731	1,757	2
2011	Air Force	Delaware	Dover Air Force Base	C-5M/C-17 Maintenance Training Facility, Phase 2	FJXT113001	2,906	2,952	2
2013	Army	Georgia	Fort Gordon	Multipurpose Machine Gun Range	67017	6,357	6,483	2
2011	Army	Texas	Fort Bliss	Scout Gunnery Complex	72179	14,015	14,298	2
2010	Air Force	Nevada	Creech Air Force Base	Unmanned Aerial System Security Updates	LKTC093111	2,434	2,489	2
2011	Army	New York	Fort Drum	Aircraft Fuel Storage Complex	62580	13,071	13,411	3
2012	Air Force	California	Vandenberg Air Force Base	Education Center	XUMU033002	12,838	13,185	3
2011	Army	North Carolina	Fort Bragg	Brigade Complex	64340	22,969	23,598	3
2012	Army	Kentucky	Fort Campbell	Barracks	73541	20,845	21,465	3
2014	Air Force	New Mexico	Cannon Air Force Base	Airmen And Family Readiness Center	CZQZ013004	4,954	5,102	3
2011	Army	Texas	Fort Bliss	Squad Defense Range	72184	2,718	2,804	3
2012	Army	Texas	Fort Bliss	Water Well, Potable	74845	2,170	2,248	4
2010	Army	North Carolina	Fort Bragg	Company Operations Facility	65202	2,980	3,089	4
2010	Air Force	Oklahoma	Altus Air Force Base	Repair Taxiways	AGGN983005P2	18,295	19,033	4
2011	Army	Missouri	Fort Leonard Wood	General Instruction Building/Tech Escort Addition	65009	6,350	6,616	4
2013	Navy	South Carolina	Beaufort	Simulated LHD Flight Deck	P456	11,657	12,191	5

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2011	Air Force	Guam	Andersen Air Force Base	Guam Strike Ops Group & Tanker Task Force Renovation	AJJY113007	8,221	8,627	5
2010	Navy	California	Twenty-nine Palms	Laydown Site Work, North Mainside	P171	19,590	20,560	5
2010	Air Force	Colorado	Peterson Air Force Base	C-130 Squad Operations/Aircraft Maintenance Unit	TDKA109005	4,710	4,946	5
2011	Navy	North Carolina	Camp Lejeune	Bachelors Quarters - Courthouse Bay	P1251	38,290	40,237	5
2011	Army	Maryland	Fort Meade	Indoor Firing Range	65793	6,885	7,241	5
2013	Air Force	North Dakota	Minot Air Force Base	B-52 Add/Alter Munitions Age Facility	QJVF092011	4,161	4,377	5
2012	Air Force	North Dakota	Minot Air Force Base	B-52 Two-Bay Phase Maintenance Dock	QJVF092012	30,523	32,123	5
2010	Army	Florida	Eglin Air Force Base	Hand Grenade Qualification Course	65697	1,243	1,309	5
2012	Army	Colorado	Fort Carson	Aircraft Loading Area	77319	30,186	31,792	5
2010	Army	Georgia	Fort Benning	Training Area Tank Trails	65557	8,724	9,201	5
2011	Navy	California	Coronado Naval Base	Rotary Hangar	P750	60,740	64,064	5
2011	Army	Georgia	Fort Stewart	Modified Record Fire Range	67166	3,389	3,576	6
2015	Air Force	Guam	Joint Region Marianas	PRTC- Combat Communication Infrastructure Facility	SAKW113008	3,397	3,586	6
2010	Army	Arizona	Fort Huachuca	Battalion Headquarters UAV	66441	5,459	5,769	6
2010	Army	Washington	Fort Lewis	Live Fire Exercise Shoothouse	41842	2,285	2,415	6
2010	Air Force	Alaska	Clear Air Force Station	Power Plant Facility	DXEB043001	21,733	23,009	6
2011	Navy	California	San Diego Naval Base	Bachelor Enlisted Quarters, Homeport Ashore	P405	68,142	72,294	6
2010	Air Force	Alaska	Elmendorf Air Force Base	Red Flag Alaska Add/Alter Operations Center	FXSB103009	2,777	2,947	6
2014	Air Force	Nevada	Nellis Air Force Base	F-35 Alt Mission Equipment Storage	RKMF103005	4,521	4,830	7

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2011	Army	Washington	Fort Lewis/Yakima	Sniper Field Fire Range	65386	3,379	3,611	7
2011	Army	Texas	Fort Bliss	Urban Assault Course	63880	2,540	2,720	7
2013	Air Force	Utah	Hill Air Force Base	F-35 Add/Alter Building 118 For Flight Simulator	KRSM113028	3,595	3,879	8
2011	Army	Texas	Fort Hood	Convoy Live Fire	66532	2,900	3,132	8
2011	Navy	California	Camp Pendleton	BEQ-13 Area	P1113	38,774	41,889	8
2013	Army	Washington	Yakima Training Center	Convoy Live Fire Range	67545	4,609	4,991	8
2013	Army	Texas	Fort Hood	Modified Record Fire Range	67020	3,780	4,095	8
2011	Army	Kentucky	Fort Campbell	Automated Sniper Field Fire Range	67015	1,373	1,496	9
2012	Air Force	Arizona	Davis-Monthan Air Force Base	HC-130J Joint Use Fuel Cell	FBNV123002	11,339	12,361	9
2011	Air Force	Texas	Lackland Air Force Base	Recruit/Family In-processing and Information Center	MPLS093737V	19,706	21,500	9
2011	Army	Germany	Grafenwoehr	Barracks	69613	16,776	18,352	9
2010	Army	Oklahoma	Fort Sill	Automated Infantry Squad Battle Course	62398	3,134	3,431	9
2010	Army	Florida	Eglin Air Force Base	Grenade Launcher Range	65695	1,428	1,567	10
2012	Army	Georgia	Fort Gordon	Hand Grenade Familiarization Range	71705	1,317	1,450	10
2010	Army	Washington	Fort Lewis	Animal Building	63513	2,751	3,029	10
2011	Army	North Carolina	Fort Bragg	Vehicle Maintenance Shop	73947	6,800	7,491	10
2010	Army	Georgia	Fort Benning	Fire and Movement Range	65034	2,505	2,763	10
2011	Army	Georgia	Fort Stewart	Automated Infantry Platoon Battle Course	72189	5,618	6,200	10
2012	Air Force	Greenland	Thule Air Base	Dormitory	WWCX103033	25,192	27,936	11
2010	Navy	Guam	Andersen Air Force Base	North Ramp Parking, Phase 1	P101	79,957	88,798	11
2010	Army	Texas	Fort Hood	Urban Assault Course	57130	2,140	2,378	11

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2011	Army	Texas	Joint Base San Antonio	Training Aids Center	71116	5,622	6,318	12
2012	Army	Washington	Joint Base Lewis-McChord	Air Support Operations Facilities	60344	6,678	7,512	12
2010	Army	Texas	Fort Bliss	Automated Sniper Field Fire Range	72161	3,850	4,355	13
2010	Army	South Carolina	Fort Jackson	Modified Record Fire Range	59507	3,241	3,672	13
2012	Army	Louisiana	Fort Polk	Multipurpose Machine Gun Range	67033	7,488	8,493	13
2012	Air Force	New Mexico	Cannon Air Force Base	Addition/Alter Wastewater Treatment Plant	CZQZ133001	6,845	7,787	14
2011	Army	Oklahoma	McAlester Army Ammunition Plant	Igloo Storage, Depot Level	53389	2,724	3,110	14
2015	Air Force	Kansas	McConnell Air Force Base	KC-46A Alter Taxiway Foxtrot	PRQE155124	4,960	5,679	15
2010	Navy	Washington	Naval Air Station Everret	Joint Personnel Recovery Agency Specialized Sere Training	P702	11,497	13,266	15
2010	Air Force	North Dakota	Minot Air Force Base	Munitions Trailer Storage Facility MHU-196	QJVF102002	1,351	1,562	16
2010	Army	Kansas	Fort Riley	Land Vehicle Fueling Activity	68792	3,366	3,896	16
2012	Army	Virginia	Joint Base Langley-Eustis	Aviation Training Facility	59005	23,868	27,698	16
2010	Army	Oklahoma	McAlester Army Ammunition Plant	General Purpose Storage Building	66545	10,147	11,779	16
2011	Army	Virginia	Fort A.P. Hill	Indoor Firing Range	65789	5,617	6,572	17
2010	Navy	Florida	Blount Island Marine Corps Support Facility	Port Operations Facility	P006	3,400	3,982	17
2013	Navy	California	Camp Pendleton	Mv22 Aviation Simulator Building	P113	3,739	4,380	17

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Air Force	Texas	Lackland Air Force Base	Evasion, Conduct After Capture Training	MPLS083005	4,396	5,160	17
2014	Air Force	New Mexico	Cannon Air Force Base	Satellite Dining Facility	CZQZ073023A	5,960	7,001	17
2010	Navy	Texas	Corpus Christi Naval Air Station	Operational Facilities for T-6	P437	17,874	21,037	18
2011	Army	Texas	Fort Bliss	Transient Training Complex	65941	28,420	33,875	19
2010	Air Force	Florida	Hurlburt Field	Electrical Distribution Substation	FTEV053005	7,489	8,979	20
2011	Army	Afghanistan	Bagram Air Base	Eastside Electrical Distribution	71605	9,121	10,944	20
2011	Army	Texas	Fort Hood	Urban Assault Course	71706	2,229	2,689	21
2011	Air Force	Texas	Dyess Air Force Base	C-130J Flight Simulator Activity	FNWZ103010	3,677	4,464	21
2011	Army	Texas	Fort Bliss	Heavy Sniper Range	72181	3,162	3,843	22
2011	Army	Texas	Fort Hood	Live Fire Exercise Shoothouse	57134	1,900	2,323	22
2010	Army	Texas	Fort Bliss	Automated Infantry Platoon Battle Course	72168	6,331	7,817	23
2011	Army	Texas	Fort Bliss	Automated Multipurpose Machine Gun Range	72178	6,056	7,493	24
2010	Air Force	Maryland	Andrews Air Force Base	Replace Munitions Storage Area	AJXF063009	8,370	10,465	25
2011	Army	Washington	Fort Lewis	Barracks	64457	42,861	58,751	37
2010	Army	New York	Fort Drum	Warrior in Transition Complex	70979	19,434	26,691	37
2010	Army	Missouri	Fort Leonard Wood	Warrior in Transition Complex	71543	17,597	28,796	64
2012	Army	New York	Fort Drum	Ammunition Supply Point	58005	5,196	9,362	80
2010	Army	Oklahoma	Fort Sill	Warrior in Transition Complex	71538	19,469	35,812	84
2012	Army	Germany	Vilseck	Barracks	69615	18,320	35,338	93
2010	Army	Virginia	Fort A.P. Hill	Automated Infantry Platoon Battle Course	67011	4,405	9,197	109
2012	Army	New York	Fort Drum	Chapel	61235	6,919	15,203	120

Fiscal year	Service	State/country	Installation	Project title	Project number	Form 1391 cost estimate[a] (dollars)	Contract award amount (dollars)	Percent change from Form 1391 cost estimate to contract award amount
2010	Army	Colorado	Fort Carson, Colorado	Modified Record Fire Range	72170	4,005	10,435	161
2011	Army	New York	West Point Military Academy	Urban Assault Course	65166	1,552	4,465	188

Source: GAO analysis of Department of Defense information. | GAO-18-101

Notes: Numbers may not total due to rounding. No projects were initiated and completed in fiscal year 2016 at the time of our review.

[a]The Form 1391 estimate excludes costs for supervision, inspection, and overhead as well as contingency costs since those costs are not included in the contract award amount.

Appendix IV: Military Department Guidance for Developing Military Construction Cost Estimates

The military departments of the active component have gone beyond the Unified Facilities Criteria and developed their own guidance for military construction (MILCON) that more closely aligns with the 12 steps needed for developing high-quality, reliable estimates. Table 17 describes the guidance developed by the military departments to align with those steps.

Table 17: Military Department Guidance on Military Construction (MILCON) Cost Estimating

Step	Military department guidance
Define estimate's purpose	The Air Force's *Planning and Programming Military Construction Projects* identifies cost estimates as part of project development, which is one of the most important actions in MILCON programming. The Naval Facilities Engineering Command's Cost Engineering Policy and Procedures Interim Guidance 2017-2019 identifies various types of estimates for the purpose of Form 1391 documentation. The guidance also specifies that a basis of cost estimate is required for all projects to be submitted with the cost estimate.
Develop the estimating plan	None
Define the program characteristics	The Army Corps of Engineers' *Cost Engineering Policy and General Requirements* states that the development of cost estimates should include a total life cycle cost analysis. The Air Force's *Planning and Military Construction Projects* instruction states that installations should identify facility needs 3 to 5 years in the future and determine which needs cannot be met with existing facilities. It also provides a source that defines typical requirements for a given facility type.
Determine the estimating structure	The Army Corps of Engineers' *Cost Engineering Policy and General Requirements* defines the work breakdown structure as a product-oriented hierarchy of the project scope of work that provides a system for organizing the estimate in a logical manner. It also states that cost estimates will be prepared in a professional manner in accordance with the work breakdown structure as described in specific cost engineering regulations for civil works, military, and environmental restoration programs. The Air Force *Facility Requirements* manual provides information regarding what facilities and technical considerations should be accounted for regarding different classes of facilities. Naval Facilities Engineering Command's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* provides a reference to several standardized estimating structures. Moreover, the guidance provides an example of a work breakdown structure and stresses the importance of standardization to promote consistency.

Step	Military department guidance
Identify ground rules and assumptions	The Army Corps of Engineers' *Cost Engineering Policy and General Requirements* states that estimates should include design assumptions and the proposed construction processes so that future design changes or construction modifications can be analyzed for cost impacts. Further, the Army Corps of Engineers' guidance states that the basis for cost estimates must be thoroughly explained and address specific issues such as design assumptions and site conditions. Naval Facilities Engineering Command's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* specifies that a schedule should be developed in conjunction with the cost estimate and provides a list of ground rules and assumptions that should be included in the estimate file.
Obtain the data	The Army Corps of Engineers' *Military Programs Cost Engineering* states that in the absence of the latest design data, empirical cost data from parametric cost models, local historical cost, or empirical cost data from commercial sources may be used. The guidance also details how the data from an estimate should also be stored in databases. The Air Force's *Planning and Programming Military Construction Projects* states that cost estimates must be consistent with the Office of the Secretary of Defense's pricing guide or be fully justified with historical cost data. The Naval Facilities Engineering Command's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* discusses the use of various estimating tools, such as MII, which interfaces with support modules and databases used by the Tri-Service Cost Engineering community.
Develop the point estimate and compare with an independent estimate	The Army Corps of Engineers' Military Programs Cost Engineering guidance states that final design control estimates will be prepared as if the government were bidding in competition with experienced contractors. The guidance also directs that all construction cost estimates be based upon the latest design data. The Air Force's *Planning and Programming Military Construction Projects* states that cost estimates must be closely scrutinized to ensure that they are consistent with the Office of the Secretary of Defense's pricing guide or fully justified with historical cost data. The guidance further states that the estimate should account for unique requirements, contingency, and supervision, inspection, and overhead costs.
Conduct a sensitivity analysis	The Navy's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* provides additional detail regarding a sensitivity analysis. For example, the guidance sets a threshold for the development of a formal cost and schedule risk analysis and discusses areas of high-risk concern that should be identified as key risk drivers.
Conduct a risk analysis	The Naval Facilities Engineering Command's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* includes an entire section on the development of a joint cost and schedule risk assessment including a recommended threshold for when to apply the assessment to military construction projects, two recommended methods to develop the assessment, inputs and outputs for the assessment, and the identification of software to develop the assessment.
Document the estimate	The Army Corps of Engineers' *Cost Engineering Policy and General Requirements* states that one of the primary responsibilities of the District Command, through the cost engineering element, is to maintain complete documentation of project cost changes. Further, the project management team depends on the cost engineer for a complete, accurate, and well-documented construction cost estimate. The Air Force's *Planning and Programming Military Construction Projects* provides a list of documents necessary to be included in MILCON project files as part of the MILCON process. A list of suggested source documentation for the scope and quantity of primary and supporting facilities, the unit cost, and the sustainability and energy measures is also provided. Naval Facilities Engineering Command's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* discusses which estimating software is to be used for different classes of estimates.

Step	Military department guidance
Present estimate to management	The Army Corps of Engineers' *Cost Engineering Policy and General Requirements* states that all cost estimates shall be reviewed internally, approved, and signed by the chief of the cost engineering element before release or submission to higher authority. During interviews, officials discussed the *Cost Estimate Improvement Plan*, which will include improvements to the reviewer and approval process of MILCON cost estimates. However, this plan has not yet been implemented. Navy officials stated that the management approval process for project budget cost estimates is embedded in the Form 1391 planning and programming process. While this explanation does show that the estimates go through many management reviews prior to submission to Congress, nowhere in the Navy MILCON policy and guidance is there a discussion regarding what should be included in the brief to management except for Form 1391 to ensure that management understands how the assumptions used can impact the cost estimate developed.
Update the estimate	The Army Corps of Engineers' *Military Programs Cost Engineering* directs that cost data will be prepared and submitted for the Historical Analysis Generator database. The stored cost data are available to all Army Corps of Engineers elements. Moreover, the Army Corps of Engineers' *Cost Engineering Policy and General Requirements* states that the development and maintenance of historical cost databases are essential to ensure accuracy and reliability of cost estimates and that these databases should be based upon the latest approved work breakdown structure specific to each program to ensure uniformity and consistency of cost data. The Naval Facilities Engineering Command's *Cost Engineering Policy and Procedures Interim Guidance 2017-2019* provides four classes of detailed government construction cost estimates to be developed at various phases of design completion for the project. Additionally, the policy states that the estimate detail for each submittal shall be commensurate with the level of design required for that submittal.

Source: GAO analysis of Department of Defense information. | GAO-18-101.

Appendix V: Comments from the Department of Defense

ASSISTANT SECRETARY OF DEFENSE
3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400

ENERGY,
INSTALLATIONS
AND ENVIRONMENT

MAR 0 8 2018

Mr. Brian J. Lepore
Director, Defense Capabilities and Management
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Lepore:

This is the Department of Defense (DoD) response to the Government Accountability Office (GAO) Draft Report, GAO-18-101, "DEFENSE CAPABILITIES: Action Needed to Increase the Reliability of Construction Cost Estimates," dated February 8, 2018 (GAO Code 100478). Detailed comment on the report recommendation is enclosed.

Sincerely,

Lucian Niemeyer

Enclosure:
As stated

GAO Draft Report Dated February 8, 2018
GAO-18-101 (GAO CODE 100478)

"DEFENSE CAPABILITIES: ACTION NEEDED TO INCREASE THE RELIABILITY OF CONSTRUCTION COST ESTIMATES"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATION

RECOMMENDATION 1: The Secretary of Defense should direct the Assistant Secretary of Defense for Energy, Installations, and Environment, to work with DoD's construction agents, military departments and other offices to improve its MILCON cost estimating guidance by fully incorporating all the steps required for developing high-quality reliable cost estimates.

DoD RESPONSE: Partially concur. The Department does not concur that it is suitable to fully apply all twelve of the cost estimating steps in the Cost Guide to any military construction projects, due to characteristics of the military construction program which differ from those of major system or weapon acquisition programs—a point acknowledged by GAO (page 23 of the draft report). The Department does concur, however, with the intent and general applicability of the twelve steps to military construction; that DoD cost estimating guidance lacks specificity in several of these areas; and that expanding our cost guidance to more fully incorporate these steps would benefit the military construction program. The Department is planning to address this by revising its cost guidance during Fiscal Year 2019.

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Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

Brian J. Lepore, (202) 512-4523 or leporeb@gao.gov

Staff Acknowledgments

In addition to the contact named above, Maria Storts, Assistant Director; Bonita Anderson; Shawn Arbogast; Ronald Bergman; Brian Bothwell; Robert Brown; Farrah Graham; Mae Jones; Jennifer Leotta; Amie Lesser; Felicia Lopez; Carol Petersen; Vikki Porter; Steve Pruitt; and Karen Richey made key contributions to this report.

Appendix VII: Accessible Data

Data Table

Accessible Data for Figure 1: Four Characteristics of a Reliable Cost Estimate and Associated Best Practices

Reliable cost estimate characteristics	Reliable cost estimate associated best practices
Comprehensive	The cost estimate should: • Include both government and contractor costs of the program over its full life cycle. • Completely define the program, reflect the current schedule, and be technically reasonable. • Be structured in sufficient detail to ensure that costs are neither omitted nor double-counted. • Be based on a product-oriented work breakdown structure that allows a program to track cost and schedule by defined deliverables. • Document all cost-influencing ground rules and assumptions.
Credible	• The cost estimates should discuss any limitations of the analysis because of uncertainty or biases surrounding data or assumptions. • Major assumptions should be varied, and other outcomes recomputed to determine how sensitive they are to changes in the assumptions (i.e., sensitivity analysis). • A risk and uncertainty analysis should be performed to determine the level of risk associated with the estimate. • The estimate's results should be cross-checked, and an independent cost estimate should be developed to determine whether other estimating methods produce similar results.

Reliable cost estimate characteristics	Reliable cost estimate associated best practices
Accurate	The documentation should: • Provide for results that are unbiased and should not be overly conservative or optimistic. • Be grounded in a historical record of cost estimating and actual experiences on other comparable programs. • Be updated regularly to reflect material changes in the program and actual costs. An estimate is accurate when it is based on an assessment of most likely costs, adjusted properly for inflation, and contains few, if any, minor mistakes.
Well-documented	The documentation should: • Capture the source data used, the calculations performed and their results, and the estimating methodology used to derive each work breakdown structure element's cost. • Be captured in such a way that the data used to derive the estimate can be traced back to and verified against their sources so that the estimate can be easily replicated and updated. • Discuss the technical baseline description and how the data were normalized. The final cost estimate should be reviewed and accepted by management on the basis of confidence in the estimating process and the estimate produced by the process.

Agency Comment Letter

Accessible Text for Appendix V: Comments from the Department of Defense

Page 1

ASSISTANT SECRETARY OF DEFENSE

3400 DEFENSE PENTAGON

WASHINGTON, DC 20301-3400

MAR 08 2018

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U.S. Government Accountability Office

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Washington, DC 20548

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